

Multigenerational Living in the Urban High-Rise:
Designing for Hawaii's Extended Family

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December 2009

Submitted towards the fulfillment of the requirements for the Doctor of Architecture Degree.

School of Architecture
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Doctorate Project Committee


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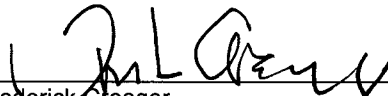
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December 2009

We certify that we have read this Doctorate Project and that, in our opinion, it is satisfactory in scope and quality in fulfillment as a Doctorate Project for the degree of Doctor of Architecture in the School of Architecture, University of Hawai'i at Manoa.


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ABSTRACT

As the economy continues in the direction of uncertainty, with the increasing housing cost overwhelming homebuyers across the nation, and with social, cultural, and financial aspects drawing families closer in this time of complexity, many people are searching for alternative living solutions. Many of these factors are causing families to convert their nuclear households into tolerable communal settings based on the concept of generational living. Families are finding this lifestyle a viable living alternative that responds to the various economic and social challenges occurring today.

According to the data from the 2000 United States Census Bureau, approximately 3.9 million residences have been identified as residing in multigenerational households¹. The census further indicates that nearly 4% of homes in the United States consist of three or more generations. Among the highest proportions of multigenerational households in the nation, Hawaii accounts for an estimated 8.2 percent of families living in an extended dwelling environment.²

Sharing living quarters with an extended family is a growing trend that concentrates on the various needs of the unit. Multigenerational households are emerging in today's society because of higher life expectancy, lack of affordable housing, social/cultural influences to maintain family bonds, and financial factors. However, are current living arrangements in Hawaii appropriately designed for these conditions? With soaring housing costs and limited buildable land, Hawaii is in need of a

¹ United States Census Bureau, Multigenerational Households Number 4 Million According to Census 2000, (CB01-CN.18. Washington: GPO, 2001), 1.

² Ibid., 1.

new type of dwelling design to alleviate urban sprawl and overcrowding in homes, and to address alternative living situations.

This Doctorate Project provides an in-depth analysis on multigenerational living. Through the conduction of research, personal interviews, surveys, and case studies, an urban living dwelling was designed for the generational family—an apartment unit that addresses the diversity and changeability of the family's needs. This vision of the multigenerational apartment is intended to increase housing supply and/or density without rapidly transforming the urban landscape, to support a diverse population, and to support families at any income level, while adapting to the internal evolution of generations within a dwelling space.

TABLE OF CONTENTS

ACKNOWLEDGEMENTS	iii
ABSTRACT	iv
LIST OF TABLES.....	ix
LIST OF FIGURES.....	x
CHAPTER 1. INTRODUCTION	1
Project Statement.....	1
Background	3
Brief History on the Multigenerational Family in America.....	3
Present-day Family	7
Reflection	9
CHAPTER 2. ADDRESSING THE NEED FOR MULTIGENERATIONAL HOMES.....	11
Evolving Family Structure	12
Agriculture Era	13
Industrial Era	14
Present and the Future	15
Higher Life Expectancy	18
Senior Care	20
Child Care	21
The Single-family Dwelling	22
Lack of Affordable Housing	24
Reflection	26
CHAPTER 3. HAWAII’S FAMILY AND HOUSEHOLD COMPOSITION	27
The Family Structure in Early Hawaiian Society	28
Hawaii’s Demographic	30
Ethnicity.....	31
Marriage and Divorce.....	33
General Population.....	35
The Elderly Population	35
Household Composition and Demand	36
‘Ohana Zoning.....	39
Reflection	41
CHAPTER 4. INTERVIEWS	42
Multigenerational Family Interview Summaries.....	43
Multigenerational Interview Summary Chart	43
Multigenerational Interview—Lifestyle.....	44
Multigenerational Interview—Design.....	47
Seagull Schools, Kapolei, Hawaii—Mixing of Generations	50
Analysis on the Intergenerational Program and Benefits of Mixing Generations	51
CHAPTER 5. ANALYZING THE MULTIGENERATIONAL LIFESTYLE	54
Understanding the Dynamics of Each Generation	55
Benefits and Challenges	58

Dwelling — Issues.....	60
Reflection	63
CHAPTER 6. DESIGN PRINCIPLES AND PRECEDENTS.....	64
Flexibility/Adaptability.....	64
Pile Up, Rheinfelden, Switzerland	65
Housing Development in Wiesbaden, Germany	68
Identity.....	70
Drawer House, Tokyo, Japan.....	71
New Urban Dwelling.....	72
NEXT21, Osaka, Japan	74
Precedent.....	76
Skyvillage in Rodovre, Denmark	76
Skyvillage Summary.....	79
Naked House, Kawagoe, Japan.....	80
Key Points	82
CHAPTER 7. DESIGN: THE MULTIGENERATIONAL UNIT.....	84
Overview	84
Place—An Ideal Site	85
‘Oahu.....	86
Ward-Kaka‘ako.....	87
Proposed Site and Land Use	88
Master Plan	90
Design Statement.....	91
Design Process	92
Users.....	92
Needs and Issues	93
Prototype A and B.....	97
Base Living and Zones.....	97
Prototype A Design	100
Prototype A Design—Floor Plans	102
Prototype A Design—Flexible Layouts.....	103
Prototype B Design	104
Prototype B Design—Floor Plans	105
Prototype B Design—Flexible Layouts.....	107
Prototype A and B Design Issues	108
Prototype C Design	108
Base Living.....	110
Base Living Zones.....	111
Design	112
Prototype D Design	122
Prototype D Design—Floor Plans	123
Prototype C + D Design Composition and Conclusion.....	124
Elevation + Form	126
Model + Renderings.....	127
CHAPTER 8. CONCLUSION	128
APPENDIX A: INTERVIEW QUESTIONS.....	130

APPENDIX B: MULTIGENERATIONAL FAMILY INTERVIEW SUMMARIES	132
Interviews	132
Family A	132
Family B	133
Family C	135
Family D	136
Family E	137
Family F	138
Family G	140
REFERENCES.....	142

LIST OF TABLES

Table 1. Percentage of Extended Household Composition in the United States	7
Table 2. 2000 U.S. Census on Contemporary Families.....	8
Table 3. The Elderly Population in the United States.....	19
Table 4. Child Care Supply and Demand in the State of Hawaii and the Nation	22
Table 5. Shelter-to-Income Ratio, 2006	25
Table 6. Total Population of Hawaii and Honolulu	35
Table 7. Population and Life Expectancy of the Older Adult in Hawaii	36
Table 8. Households and Families in the United States and Hawaii.....	37
Table 9. SMS Hawaii Policy Study: Buyer and Renter Preferences (2006)	38
Table 10. ‘Ohana Zoning Provisions.....	40
Table 11. Multigenerational Interview Summary Chart	43
Table 12. Generational Dynamics.....	56
Table 13. Benefits and Challenges	58
Table 14. Design Issues	62

LIST OF FIGURES

Figure 1. Family Structure in the Agriculture Era	13
Figure 2. Family Structure in the Industrial Era	14
Figure 3. Nuclear Family Structure	15
Figure 4. Single-Parent Mother Headed Family Structure	16
Figure 5. Single-Parent Father Headed Family Structure	16
Figure 6. Non-Family Family Structure	16
Figure 7. Extended Family Structure.....	16
Figure 8. Ethnicities in the State of Hawaii, 2007.....	32
Figure 9. Seagull Schools, Kapolei, Hawaii	50
Figure 10. Design Issues—Floor Plan	61
Figure 11. Pile Up, Rheinfelden, Switzerland.....	65
Figure 12. Pile Up Concept.....	66
Figure 13. Housing Development in Wiesbaden, Germany	68
Figure 14. Housing Development Floor plans in Wiesbaden, Germany	69
Figure 15. Drawer House, Tokyo, Japan	71
Figure 16. Next21, Osaka, Japan	74
Figure 17. Skyvillage, Rodovre, Denmark.....	76
Figure 18. Skyvillage Program Flexibility	78
Figure 19. Shigeru Ban's Naked House, Kawagoe, Japan	80
Figure 20. Naked House Floor Plan.....	81
Figure 21. Proposed Project Site Location and Land Use	89
Figure 22. Ward Neighborhood Mater Plan Renderings	90
Figure 23. Users in a Multigenerational Household	93
Figure 24. Evolution of the Family in a Static Household.....	95
Figure 25. Design Issues	96
Figure 26. Base Living Proposal	98

Figure 27. Base Living Zones	99
Figure 28. Prototype A Floor Plans	102
Figure 29. Prototype A Flexibility	103
Figure 30. Prototype B Floor Plans	106
Figure 31. Prototype B Flexibility	107
Figure 32. Prototype C Base Living	110
Figure 33. Prototype C Base Living Zones	111
Figure 34. Evolution of the Family + Component Kit + Space Process	112
Figure 35. Prototype C—Evolving Urban Unit.....	115
Figure 36. Prototype C—Evolution 1	116
Figure 37. Prototype C—Evolution 2.....	117
Figure 38. Prototype C—Evolution 3.....	118
Figure 39. Prototype C—Evolution 4/5.....	119
Figure 40. Prototype C—Evolution 6.....	120
Figure 41. Prototype C—Build up the Multigenerational Unit.....	121
Figure 42. Prototype D Component Kit	122
Figure 43. Prototype D Floor Plans	123
Figure 44. Design Composition.....	125
Figure 45. Elevation + Form.....	126
Figure 46. Model + Renderings.....	127

CHAPTER 1. INTRODUCTION

Project Statement

In Hawaii, the extended household is a growing trend that concentrates on sharing living quarters among multiple generations. Annual data previously collected by the State of Hawaii Department of Health reveals a growing trend in multigenerational households throughout the nineties. In 1990, 5.5% of households surveyed included the presence of more than two generations in the home; by 1997, that number had increased to 7.3% with the highest percentage of multigenerational households present on Oahu.³

According to the 2000 U.S. Census, 8.2% of the Hawaii population is living in a multigenerational household—the highest percentage in the United States. Strong cultural/social influences, soaring housing costs, economic factors, and limited buildable land are sources for an emerging household composition of blended generations. The multigenerational household can also provide an affordable method to live and care for a network of family members. Given that Hawaii is the leading state with families residing in a three or more generational home, it seems appropriate to question current living arrangements and dwellings in Hawaii. Are homes in Hawaii appropriately designed for multigenerational conditions? How can architects create a flexible living space for multigenerational families? A phenomenon of multigenerational households is the need for a dynamic existence—a home that adapts its functions and layout to the changing needs and patterns of the family. With an inability to accommodate change, the static form of today's standard single-family dwellings should be rethought and redesigned as

³ Ivette Rodriguez, Sylvia Yuen Stern, and Shi-Jen He, Portraits of Hawaii's Families, (Honolulu: University of Hawaii Center of the Family, 2004), 6.

a responsive living environment that interacts with its users. Therefore, the primary design objective in this research is to propose a flexible living environment that meets the needs of its multigenerational occupants.

The research presented here focuses on the multigenerational lifestyle and how this complex living arrangement is affecting families residing within this type of environment. Analyzing social elements that impact change in the family structure will assist in the development of a new tectonic for residential designs in Hawaii—a new type of dwelling design that could assist with alleviating urban sprawl, possibly solve current deficiencies of the nuclear dwelling, and address alternative living situations that may be appropriate for the modern family. The final design product is envisioned as a prototypical apartment unit that addresses and emphasizes multigenerational living. The idea of a vertical design structure or apartment complex, rather than a single-family detached home, can provide many more advantages to multigenerational living and Hawaii. The primary advantage of a vertical living, mixed-use arrangement is that it creates the idea of integrated living, thereby encouraging mutual support from the different groups of families and generations occupying the complex. The concept of integrated living responds to the changes occurring in present society and can accommodate the diversity of living dynamics.

The research and design methodology that is employed in this doctorate project takes the form of a qualitative and precedent-based research study. The project utilizes a qualitative method to understand the housing conditions in Hawaii and the multigenerational lifestyle in order to develop a functional design product: a prototypical apartment unit. The qualitative data was obtained through personal interviews with local families to gain an understanding of Hawaii's family design-oriented needs, living dynamics, and lifestyles. Several precedent projects were studied to formulate the

design and thought process for multigenerational living. Precedents of apartment complexes that are designed for flexibility, reducing urban sprawl, and integrated living were primary elements of consideration.

Background

The nuclear family--a unit consisting of a father, mother, and their children--is the quintessential image of a traditional American family household. Due to major economic and social transformations occurring in our society today, the nuclear family is evolving and adapting into a collective group of generations. This emerging living structure of three or more generations residing under one roof is being accepted as the modern American family.

The multigenerational family, which accounts for approximately 3.9 million households in the United States, represents a growing lifestyle that is taking into account the dramatic rise in life expectancy, the proliferation of working families, the growing cost of elder care, the increasing need for child care, and a frustrating lack of affordable housing.⁴ With a reemergence of multigenerational living, it is important to address the impacting elements that are changing the household and family structure into a modern, extended living environment.

Brief History on the Multigenerational Family in America

The accuracy of the history and formation of the multigenerational family is uncertain due to the lack of detailed historical resources and early statistical census data. However, Professor Steven Ruggles of the University of Minnesota indicates that

⁴ Graham Niederhaus, Sharon, and John L. Graham, Together Again: A Creative Guide to Successful Multigenerational Living, (United Kingdom: M. Evans, 2007), 3.

a form of extended family structure was dominant in nineteenth century America and quite probably in the early eighteenth century as well.⁵

Historically, in the eighteenth and nineteenth centuries, the multigenerational family was structured around the production of agriculture and involvement in the family's business and/or farm. The children's inheritance of the business ensured continuity of the labor supply on farms, in other traditional livelihoods, and provided economic security in old age. The two generations were interdependent. Elders needed their children to operate the farm; but, as long as the elders held the property, they remained ultimately in control.⁶ The farm was the core of the family in the agricultural era. Members of the immediate and extended family worked in collaboration for the growth of social capital. Wages were not a significant part of the economy at this time because most people ate what they grew and made their own clothes, as well as other products. They didn't need to purchase nearly as much as we do today; and frequently, they could barter for commodities they needed.⁷ This mutually dependent system of generations exposed the historical family as a self-sufficient, patriarchal organization that depended on natural resources/production.

Although cultivation of crops and herding of livestock were the cornerstones of the family and maintained by all its members at this time, the eighteenth and nineteenth centuries reflect a period of history when the male figure was the dominant head of the household. As the economic authority, males led in all facets of the production of goods, while females held more subordinate roles in care of the home as the emotional provider

⁵ Steven Ruggles, The Transformation of American Family Structure, (American Historical Review, 1994), 104.

⁶ Steven Ruggles, Living Arrangements and Well-being of Older Persons in the Past, (Population Bulletin of the United Nations, 2001), 5.

⁷ Roberta Coles, Race and Family: A Structural Approach, (Marquette University: Sage Publishing, Inc., 2005), 35.

for the husband, children, and elders. The stratification of gender and roles in historical America expressed an unequal support system, but a governing element that functioned as standards for how families lived during the era. With the eighteenth/nineteenth century family structured in a hierarchal composition, the household maintained an organized system of generations that collaboratively operated for the overall survival of the unit.

The household was frequently sited near other households containing blood relatives of one sort or another. This cluster of relatives often worked together in order to coax a bare subsistence from the soil. Everyone helped care for infants and small children.⁸ In the agrarian society, nuclear family households were relatively small in size but large in inhabitants. Most American houses were small, only one or two rooms that served an array of functions. At one hour, people might cook and dine in a room and in the next hours, sleep there.⁹ Due to the large number of extended family members residing under one roof, privacy was a challenge. Spaces within the home were considered multifunctional to accommodate the various needs of the family. The home during this period was considered a place for production that maintained a profitable life. The household was a protective communal space for the inhabitants and not an identifier of wealth or status, as is perceived in present society.

The communal living identity of early families was significantly altered by the Industrial Revolution. People moved from farms to cities where new factories were being built. In cities, people no longer worked together in extended family units. Men were required to travel to and from their jobs and had less time to spend with their

⁸ John Scanlon, Designing Families: The Search for Self and Community in the Information Age, (Thousand Oaks: Pine Forge Press, 2000), xvii.

⁹ Coles, 36.

families.¹⁰ Many who had made their livelihood in farming and had expected their children would do the same were displaced by technological advancements that increased agricultural production while eliminating the need for human labor.¹¹ The extended family structure that had existed in early eighteenth and nineteenth centuries was transformed into a new living arrangement of married couples and their children. Children were no longer considered a necessity to the survival of the family. Child labor laws were passed in the late 1930's to prevent children from working under harsh conditions. A mandatory public school system was developed to teach new generations skills to obtain jobs in this new occupational structure.¹² The social changes that occurred during the Industrial period transformed the child's role from that of an economic contributor working on the farm, to that of an obligation: yet another mouth to feed that required emotional concern/rearing, etc. The male role also changed from a coexisting contributor of the family business to that of sole breadwinner, the primary provider for the family. Outside the home for most of the day, husbands became honored, sometimes distant visitors to their families. Essentially, the men's realm became the public arena; whereas the women's role became increasingly private and domesticated. With the husband being the sole provider and his wife taking domestic responsibility, the status and maintenance of a nuclear dwelling became an integral part of an "ideal family" concept during the Industrial Revolution.

The decline of multigenerational households and emergence of the single-family/nuclear dwelling was a result of great economic change in America. As evident in

¹⁰ Graham, 4.

¹¹ Coles, 38.

¹² Ibid., 38.

Table 1, from 1880 to 1980 a steady decrease of families living in an extended household occurred.

Table 1. Percentage of Extended Household Composition in the United States

Year	Percentage
1880	19.5
1910	19.9
1940	17.6
1960	11.5
1980	6.7

Source: Ruggles, Steven. The Transformation of American Family Structure.

A 13.2% decrease from 1880 to 1980, was the product of rapid rise in wage labor and the social and economic opportunities that attracted young men from the farm or away from the family business.¹³ By the 1900's, approximately 40% of the American population lived in urban areas. Housing evolved from the communal units centered around the farm/livestock into a single-family structure that accommodated a new and independent nuclear family unit. The tradition of single-family dwellings accelerated in the United States after the end of World War II.¹⁴ The nuclear family lifestyle gradually became the preferred way to live; the extended family style was discarded in large part because it did not fit with the new lifestyle of the industrial age.¹⁵

Present-day Family

Diverse family compositions began to emerge in the twentieth century. With changes in moral values and the acceptance of nonfamily unions and same-sex

¹³ Ruggles, Living Arrangements and Well-being of Older Persons in the Past, 13.

¹⁴ Graham, 4.

¹⁵ Scanzoni, xvii.

marriages, the definition of family continues to expand.¹⁶ Living in the Information Age, families are now structured around the concept of freedom to individually live their lives. With that freedom, the concept of family is being transformed to represent a more progressive and evolutionary process. In this information age, a redefinition in family structure is occurring, thus creating a modern American family that includes unique lifestyles, generational living, and single parents.

The Council on Contemporary Families provided a concise summary of how families are changing in the twentieth century. The number of people in the United States jumped from 249 million in 1990 to 282 million in 2000, and is currently growing at an increasing rate; the number is now greater than 300 million.¹⁷ This increase in population causes significant changes in family patterns. The table below describes the elements that are affecting the family structure in present society.

Table 2. 2000 U.S. Census on Contemporary Families

- Two-parent households increased 6 percent since 1990. In contrast mother-headed households grew by 25 percent. Single-mother households now make up 7 percent of all households.
- For the first time ever, less than a quarter of American households consist of nuclear families. Married couples with children make up 24 percent of all households, compared to 39 percent in 1990.
- As a result of delayed marriage, an aging population and low unemployment, there are now slightly more single-person households in the United States than there are nuclear families.
- More fathers are raising kids on their own. The number of single-father households rose 62 percent in a decade, doubling from 1 to 2 percent.
- 10 percent of the nation's population, a total of 25.8 million people, was foreign-born in 1997—a 30 percent rise since the 1990 census.
- Nationally, the number of unmarried partners grew by 71 percent during the 1990's.
- 5.8 million grandparents are living with grandchildren.
- **Households with three generations under one roof doubled in the last twenty years and the number of young adults moving back home is up 6 percent.**

¹⁶ Friedman, 5.

¹⁷ Graham, 94.

As indicated in Table 2, significant changes are occurring in the present day family structure. American family life has changed more dramatically over the past quarter century than it had during the preceding half century. These changes have evoked alarm, anxiety, and apprehension and have provoked recurrent calls for a return to the “traditional” family.¹⁸

Reflection

Due to the Industrial Revolution, various industrialized technologies have rapidly changed the way we live. The automobile gave rise to the suburbs, which drew more people away from the city. This displacement of families from a rural setting to an urban environment encouraged the large communal family to become an individualized unit. The concept of mobility, which also emerged from the Industrial Revolution, had significantly impacted how families existed and perceived their living environment, community, and personal endeavors. As a result, homeowners could now find more fitting solutions for their space needs in another residence.¹⁹ Thus flexibility was created within people’s lives and homes—a concept that was not present in the agrarian society. Families are able to exist independently and reform their family lifestyles to fit a more “modern mold”: a single family with one child and parents who are focused on their career growth. Furthermore, families took advantage of the newly found freedom and explored their personal independence, thereby leading to the various changes occurring in present society.

The family structure has evolved into a multitude of compositions that include single-parent families, nonfamily households, and extended households. The nuclear

¹⁸ Graham, 94.

¹⁹ Friedman, 3.

family is no longer our primary living arrangement. Moreover, current living conditions do not reflect inevitable changes in economic, demographic, and social factors. This research explores the changes taking place in our society and family structure to develop a residential unit that adapts to these various factors.

CHAPTER 2. ADDRESSING THE NEED FOR MULTIGENERATIONAL HOMES

People in the United States are living longer these days than ever before. According to data from the Department of Health and Human Services, the average life expectancy is now 78 years old.²⁰ Much of this rise can be attributed to medical advancements, the awareness of physical activities, and the accessibility to health care and services. These improvements in the quality of life have led to rapid increases in the elderly population in America. In fact, by 2050 there could be more people who are elderly (65 or over) than young (14 or younger). According to U.S. Census Bureau projections, the elderly population will double between now and the year 2050, to close to seventy-nine million.²¹ As the fastest growing age group, the elderly population requires the most assistance. However, with the lack of financial support in health care, the elderly population and their families are placed in a position to find other means to care for their elders. It is this factor in conjunction with the lack of affordable housing, need for child and senior care, rising cost of social and financial needs, and the high cost of living that are forcing families to discover creative approaches to maintain a healthy living environment. As a response to these economic and social challenges, multigenerational living is reemerging as an effective solution.

This chapter will analyze specific elements that are creating and transforming the classic nuclear dwelling environment into a communal living society that integrates multiple generations. Identifying the social causes that are affecting this shift in living condition will provide evidence for the need of an integrated society and for a responsive architectural solution. Increasing life expectancy accompanied by a drop in births is

²⁰ Graham, 5.

²¹ Ibid., 5.

leading to a drastic shift in our age structure, a process that calls for new strategies and responses in a great variety of areas. Housing construction must react with new and intelligent solutions.²²

Evolving Family Structure

With the increasing rates in divorce, single parents, higher life expectancies, and economic and social distress, families are reinventing themselves in a new type of household that pursues diversity and communal kinship. A revival in extended living or multigenerational households may well become the prototypical modern American family norm in the future.

To understand the evolution of the family structure throughout history and into the future, diagrams have been created to display the progression. Each figure represents one of the three major eras: agricultural, industrial, and the Information Age/future with its fundamental family composition. The following figures are further divided into three sections: family structure, primary provider, and domestic provider, to identify the structural and functional arrangements of the household during the particular era. The first section, family structure, identifies the composition of the family—who lives in the household. The second section, primary provider, articulates the individual or individuals who are in charge or act as the head of household—the financial and primary provider(s). The third section, domestic provider, is the individual or individuals who maintain the home and family members—the caretaker(s).

The schemes are personal interpretations on the diversity of household arrangements. Identifying the changes that are taking place and the various family

²² Christian Schittich, In Detail: Housing for People of All Ages: Flexible, Unrestricted, Senior-friendly, (Basel: Birkhäuser Basel, 2007), 9.

compositions will reveal the need for adaptable living arrangements. Current and future living environments should accommodate the various lifecycles of the family.

Agriculture Era

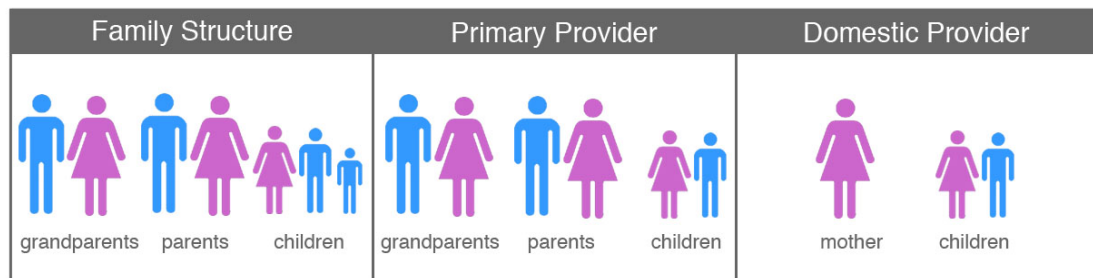


Figure 1. Family Structure in the Agriculture Era

During the Agricultural Era, the family was structured in an extended form. Situated in a rural context, the extended household functioned as a supportive unit that worked together to produce a self-sustaining environment based on agriculture production. Men provided the food; women took care of household duties, children, and elderly parents.²³ Despite the patriarchal tradition, everyone contributed to the survival and the daily functions of the family.

Households were large because of high birthrates and the common practice of taking in non-related people. Families gave birth to many children for several reasons. First, they needed child labor on the farm; second, high infant mortality rates meant an increased probability that several children would not survive to adulthood; and third, birth

²³ Graham, 4.

control was rudimentary or nonexistent.²⁴ These factors produced a large home and kin that viewed childbearing as an asset to the overall well-being of family and economy.

As mentioned, the extended family during the Agricultural Era was based on labor and survival of the kin group. The larger family structure was more of a necessity than a choice. Children inherited the home and farmland, creating a family cycle based on continuity of labor, lifestyle, and economy. The multigenerational family was a standard of living in the pre-industrial era.

Industrial Era

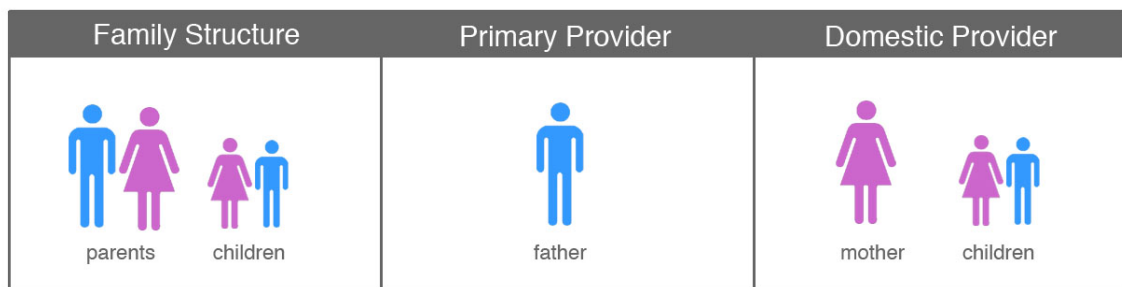


Figure 2. Family Structure in the Industrial Era

In the Industrial Age, families discarded the agrarian lifestyle for a more urban setting. Families that functioned as an extended family during the agriculture period, evolved into a single family/nuclear dwelling that focused on the husband, wife, and children living arrangement. Families during this period pursued both personal freedom and economic opportunities.²⁵ Due to the shift in economic provision, the male figure became the dominant gender as the sole financial provider for the family; the female figure stayed at home with the children.

²⁴ Coles, 35.

²⁵ Scanzoni, xviii.

Homes and family life became more private. Ironically though household population declined, houses became larger with more rooms and hallway spearing those rooms. The idea developed that children could and should sleep separately from parents and eventually from one another.²⁶ This concept created a family and household based on segregation and privacy.

The result of the Industrial Revolution provided individuals with advancements and means to achieve a stable lifestyle. Families now pursued status and wealth individually. The Industrial Revolution offered families and individual the idea of choice and freedom. This shift in economic situation not only affected household size, but also gender roles and family structuring. The separation of work and family life meant that many households became a nuclear concept.

Present and the Future

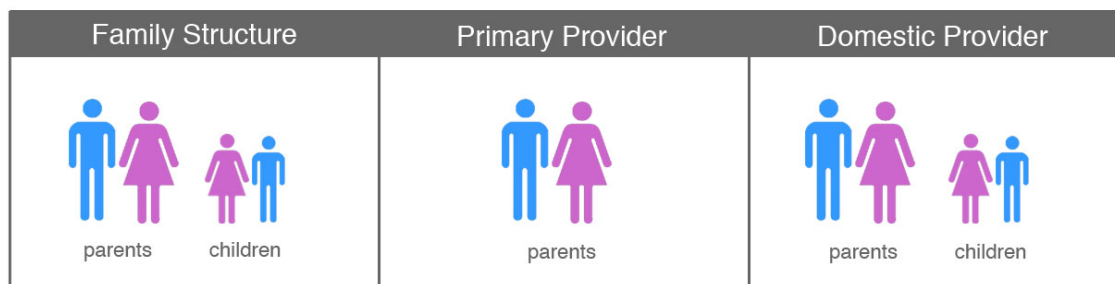


Figure 3. Nuclear Family Structure

²⁶ Coles, 40.



Figure 4. Single-Parent Mother Headed Family Structure

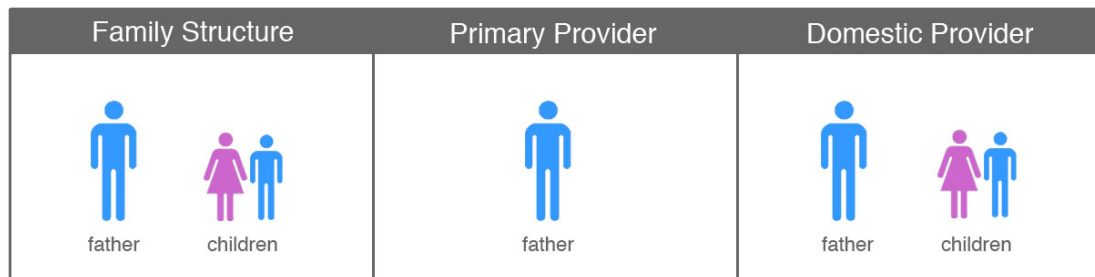


Figure 5. Single-Parent Father Headed Family Structure

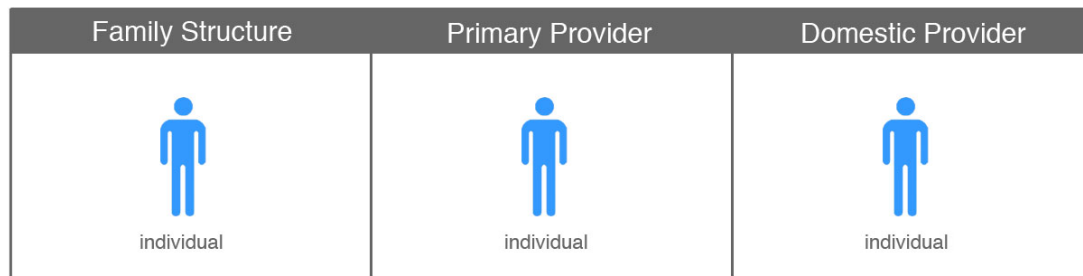


Figure 6. Non-Family Family Structure

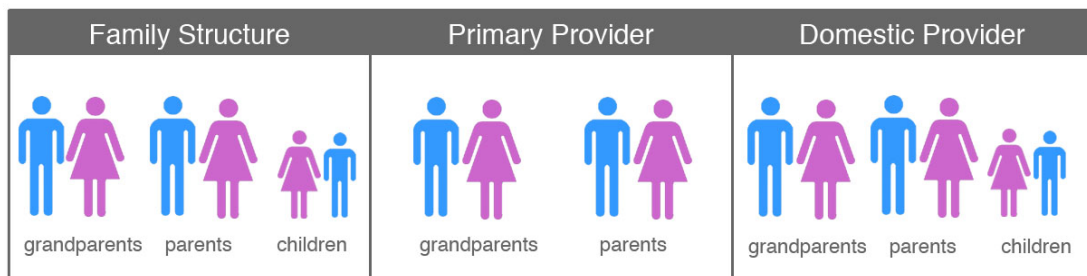


Figure 7. Extended Family Structure

The Postindustrial Era or Information Age is what some would say we are currently living in today. With the advancement of technology, the family structure has evolved into a dynamic unit. In the last 40 years, we have seen a resurgence of some family patterns prevalent in the agricultural period and the continuation of a number of patterns from the industrial era. Most notably, co-provider families once again are the majority. Women are sharing men's provider roles; men, however, have exhibited more reticence in adopting domestic roles.²⁷ The result of a resurgence of co-provider or dual-income families is that households are much more diverse in structure.

A number of changes—higher life expectancy, higher cost of living, etc.—are occurring in present society that significantly impact the structure of the family. Since families today are dealing with serious social and economic flux, new types of households and structures are being revealed and branded as the new millennium family. Single-parent households, nonfamily households, and multigenerational households are increasing throughout the United States.

In the 2002 census, single-parent households represent 22% of all households. Female's head approximately 18% of single-parent households and slightly over 4% are headed by males. Unlike the Agricultural Age, today's single-parent households are precipitated by divorce and non-marital births more often than by death. Women's increased access to paid labor has enabled unhappy wives to leave their marriages.²⁸

Nonfamily households are identified as individuals of two or more unrelated people residing in a home. This type of living arrangement represents 31% of households in the United States. These households are largely composed of marriage-postponing young adults or previously married elderly who live alone or with non-related

²⁷ Coles, 42.

²⁸ Ibid., 43.

roommates. The number of elderly living alone has risen due to continued extensions in life expectancy.²⁹

With extended living a primary arrangement during the eighteenth and nineteenth centuries, the twenty-first century family is modifying this household composition into a horizontal co-residence of blended members: children from two marriages and/or children's children living in the same household. The multigenerational household is emerging as an adaptable living arrangement for the modern family. Especially in Hawaii where there are diverse ethnic minorities, strong cultural values, and respect for the family, the extended household acknowledges a clear response to societal forces. The present multigenerational family is no longer united, based on the consistent succession of the family for economic solidity; however, it is a choice that provides solutions to a number of factors occurring in today's society.

As evident in the diagrams above, changes in the social fabric of families have transpired throughout history. A retreat from the nuclear family is taking place and producing new family structures that are building on the concept of variable family arrangements. In present society, the definition of family and household is constantly evolving. A new model of residential design must be conceived and address the changing needs of its inhabitants.

Higher Life Expectancy

The rapid increase in the number of elderly people (65 years and older) combined with a decrease in financial support for human and health services is already leading to dilemmas and sometimes disaster for some American families regarding care

²⁹ Coles, 43.

for seniors in the clan.³⁰ As evident in Table 3, a steady growth of the elderly population is occurring in the United States. This increase in life expectancy will continue to be a factor well into the next century and requires immediate attention to provide proper support for the aging population.

Table 3. The Elderly Population in the United States

Year	Population (in millions)
1960	16.6
1970	20.0
1980	25.6
1990	31.1
2000	34.7
2010	39.4
2020	53.2
2030	69.4
2040	75.2
2050	78.9

Source: U.S. Bureau of the Census

The rise in life expectancy among the aged population is due to a number of significant factors. The most considerable element is the advances of medical services and technology. Medical improvements have contributed to the decline of diseases and provided preventive measurements for many ailments. Medicare services, which offer individuals health coverage, have positively impacted the senior group by allowing governmental/private assistance in their medical expenses. This service has led to improvements in the quality of life among the elderly in the United States. Changes in an individual's personal health and behaviors are also factors that have influenced the increase in life expectancy among the 65 and over age group. Today's seniors have taken better care of themselves: less smoking, better diets, and more exercise. These

³⁰ Graham, 7.

positive steps have, at least, postponed the kinds of disabilities that require nursing home care.³¹ However, a number of seniors will be seeking long-term care in an assisted living environment.

Senior Care

Seniors with deteriorating health are primary candidates for supportive care. Assisted living involves the delivery of professionally managed personal and health care services in a group setting that is residential in character and appearance.³² This type of long-term care living environment provides better quality health and personal services than the traditional nursing home. However, affordability has been at the forefront of assisted living as it developed from the beginning. Because most assisted living has been financed on a private payment platform, there has been concern about how moderate to lower income older people can afford it.³³ Finding assisted living or care centers for seniors that are in the affordable price range is a major challenge. With the increase of life expectancy among adults 65 years and older, a demand in health care will be necessary.

Whatever the virtues of the assisted-living facility as a shelter and care environment, most older Americans consider it an unattractive choice for two reasons: they must relocate from their current housing and live in age-segregated housing--a social situation having some strong negative connotations.³⁴ With these specific reasons in mind, families are seeking alternative care that is affordable and adapts to the needs

³¹ Graham, 8.

³² Benjamin Schwarz, and Ruth Brent, Aging, Autonomy, and Architecture: Advances in Assisted Living, (Baltimore: The John Hopkins University Press, 1999), 3.

³³ Schwarz, 12.

³⁴ Ibid., 33.

of elders, both socially and physically. Home care provides elders with an alternative that places care in the comfort of their own home. About 75% of the U.S. elder population with disabilities depends exclusively on such care giving; while 90% rely, at least in part, on informal assistance—home care.³⁵ Caring for family members is an essential element of the multigenerational lifestyle. The lack of affordable care and assisted living facilities causes anxiety; therefore, the multigenerational household can alleviate the extra cost of outside treatment and help.

Child Care

Considered the primary caregiver, the female role has since evolved and an unprecedented number of women have joined the labor force. In fact, 80% of married mothers with children are employed outside the home. According to a national telephone survey of more than 44,000 working parents conducted by the Urban Institute, one in five children ages 6 to 12 are regularly left without adult supervision after school and before their parents come home from work. These demographics not only have implications for who will be available to care for the elderly, but also emphasize the growing need in America for child care.³⁶

Childcare is an important element in today's society. With the increased value on education and the need for high-quality day care, childcare centers are providing these necessities to working parents. However, as with the adult care issue, affordability is a major challenge and factor for families in not obtaining childcare support.

Childcare expenses can range anywhere from \$4,000 to \$10,000 a year per child. This expense can be prohibitive for lower and middle class

³⁵ Schwarz, 39.

³⁶ Graham, 8.

families. One third of families with young children earn less than \$25,000 per year and a family of two adults working full time on minimum wage salaries earns a combined income of only \$21,000 a year. In 1997, the median annual income of the average female-headed household was \$17,256. At such earning levels, childcare expenses can easily consume one third or more of the household budget.³⁷

As indicated in the table below, the demand for childcare in Hawaii is slightly higher than the average in the United States. Both in Hawaii and the mainland United States, families are seeking alternative care for their children. As multigenerational household grow in the following years, the need to find high-quality child services will decline. Family members, especially grandparents will function as the primary caregiver.

Table 4. Child Care Supply and Demand in the State of Hawaii and the Nation

	State of Hawaii	Nation
Number of centers	457	118,947
Accredited child care centers	99	10,876
Percent requests for infant and toddler care	76%	45%
Percent requests for full-time care	88%	82%
Percent requests for part-time care	12%	18%

Source: NACCRRRA

The Single-family Dwelling

As most contemporary housing cannot accommodate to change, families and individuals are forced to adapt to their living arrangement or move to suit varying needs. This creates an increasing disconnection between the inhabitant and their habitat. In the

³⁷ Michele Friedman, "Child Care," *Coalition on Human Needs*, n.d. <http://www.policyalmanac.org/social_welfare/childcare.shtml> (3 February 2009).

twenty-first century, society, it seems, has become accustomed to the fact that constant changes are inevitable. These changes necessitate a new design paradigm in which future dwellings need to be more adaptable to the dynamic nature of societal trends and, as a result, to their occupants' lives.³⁸ If this is true, then why are homes today still not reflecting the current economic and social evolution?

The single-family dwelling, which is the primary living environment for the nuclear family, was mass-produced after World War II.

With the return of Second World War veterans, households that had placed their aspirations on hold during wartime frugality began to search for housing with revitalized optimism and purpose. Homes, however, were in dire circumstances as demand vastly outweighed supply. The magnitude of this crucial lack in availability was further exacerbated by the 1946 to 1960 postwar baby boom, which played a key role in dictating the market housing type.³⁹

Thus, the development of homes intended for the nuclear family hastened the removal of communal living. Post-war families sought the single-family home because it symbolized their freedom from previous family values and restrictions. The single-family home reinforced the idea of nuclear family and independence. The design of the houses and the layout of the subdivision itself made it clear that each nuclear family was assumed to be independent. Rooms were arranged in ways that made it clear that only parents and their children were to be at home there.⁴⁰

³⁸ Friedman, 3.

³⁹ Ibid., 20.

⁴⁰ Scanzoni, 35.

Homes are designed and built at a particular point in time and are characterized or influenced by those temporal sensibilities, notably by particular tendencies and technologies. As time progresses, the factors and decisions that shaped the original design become increasingly dated.⁴¹ This is an interesting statement revealing the reason that homes today may not reflect new lifestyles. Because of the scale and nuclear family design of housing developments across the nation, current homes do not accept change easily. Homes should accommodate the needs of individuals and family cycles. A home that is specifically designed for various lifestyles and needs is the optimal solution for our current situation.

Lack of Affordable Housing

According to the recent publication of the State of the Nation's Housing by the Joint Center for Housing Studies of Harvard University, the demographics of those who can afford decent housing in this country has been on a downhill track since 1975. While the current low-interest rates and median incomes have made for the strongest year for housing on record, a staggering three in ten households in the United States have affordability problems. The report continues and states that affordability remains America's most widespread housing challenge.⁴² With a degrading economy and an increasing demand for housing, providing the modern family with affordable options is vital. To be considered "affordable housing" by the U.S. Department of Housing and Urban Planning, families must not pay more than 30 percent of their income. However an estimated 12 million renter and homeowner households now pay more than 50% of

⁴¹ Friedman., 4.

⁴² David Brown, The HOME House Project: The Future of Affordable Housing, (Massachusetts: MIT Press, 2005), 17.

their annual incomes for housing; while a family with one full-time worker earning the minimum wage cannot afford the local fair-market rent for a two-bedroom apartment anywhere in the United States. The lack of affordable housing is a significant hardship for low-income households preventing them from meeting other basic needs, such as nutrition and healthcare, or saving for their future and that of their families.⁴³

In Hawaii, just over 40% of state residents are paying less than 30% of their monthly income for shelter. That level is considered to be the norm for homeowners.⁴⁴ Approximately 26% of the state, however, is paying more than 40% of their annual income to housing. The table provided reveals Hawaii's shelter-to-income ratio. The table indicates that Hawaii families are paying in the affordable range—30% of their income to the home. Nevertheless, a study completed by Charles Wathen explains that only 4% of the population could afford to purchase a median priced home with one median salary; furthermore only 24% could afford such a home with up to two median salaries.

Table 5. Shelter-to-Income Ratio, 2006

	State of Hawaii	County of Honolulu
Less than 30% household income	40.7	40.6
30-40% of household income	12.8	12.4
More than 40% household income	25.7	25.1
No Shelter cost (renting without payment of cash rent and homeowners with paid-up mortgages)	20.8	21.9

Source: Hawaii Housing Policy Study, 2006

⁴³ United States Department of Housing and Urban Development, "Affordable Housing," Homes & Communities, n.d., <<http://www.hud.gov/offices/cpd/affordablehousing/index.cfm>> (3 February 2009).

⁴⁴ Hawaii Housing Finance and Development Corporation, Housing Policy Study, 2006, (Honolulu: SMS, 2007), 6.

If the rule of thumb or prevailing premise holds that families should not pay over 30% percent of their income on housing, then a number of families and individuals may be unable to find affordable housing and/or provide adequate shelter for themselves. The lack of affordable housing impacts the family on many different levels. Financially, socially, physically, and many other attributing traits are affected by the insufficiency of proper housing. Families may find that doubling up generations within a single home is a resolution to the high cost of living. However, multiple generations residing within a traditional single family home points to further inadequacies in the housing situation. Devising a living environment that celebrates and responds to the changing needs and extended family concept is ultimately a step in the right direction.

Reflection

According to professor, architect, and author Avi Friedman, the nuclear family for which most existing housing was designed now represents only two thirds of households. Understanding the critical proportions of families that do not conform to the nuclear family lifestyle is important. With two thirds representing nuclear households, accommodating the continuous evolution of the family is required to fulfill and reflect the changes.

As the population steadily increases over the next fifty years, a demand in higher quality and affordable housing will be pertinent for the modern family. The outlook on the multigenerational home is expected to increase and become more common in the future. The multigenerational lifestyle provides an alternative to accommodate family needs. Childcare, senior care, and other aspects of mutual support are addressed when living a co-habital arrangement.

CHAPTER 3. HAWAII'S FAMILY AND HOUSEHOLD COMPOSITION

Hawaii is among the highest in the nation for residents living in a multigenerational home. Given the high cost of living in Hawaii, the large immigrant population, and the strong cultural values that place an emphasis on supporting 'ohana (family), it is not surprising that Hawaii leads the nation with the highest percentage of multigenerational households.⁴⁵ According to a *Honolulu Star-Bulletin* article on multigenerational living, cultural values and other factors play a role in the high per-capita percentage of "ohana homes" in the islands. Researchers say however, the Hawaii numbers are closely linked to the high cost of housing in the state and that numbers may have increased with the recent tightening of the market.⁴⁶ The article introduces a local three generational Hawaii family who live in a small four bedroom home. The family recently moved from their Pearl City home to Kaimuki because they were unable to afford to buy in town; but they could not tolerate the commute. In today's market, they remain unable to afford a home large enough and convenient enough for them all.⁴⁷

Overcapacity of family members in a multigenerational home is a prevalent challenge: inadequate living arrangements, accommodating the various needs of family members, and adapting to a new lifestyle. With the highest percentage in the nation of families living the extended lifestyle, why are residential designs not adopting a multigenerational model? In this section, Hawaii's family and household structure are described as an aid for understanding the significant changes that are occurring. By

⁴⁵ Rodriguez, 6.

⁴⁶ Mary Vorsino, "Family Affair," *Honolulu Star-Bulletin*. 3 May 2005 <<http://archives.starbulletin.com>>, 2.

⁴⁷ Ibid., 2.

researching the elements that cause families to embrace a multigenerational living arrangement may determine what if any demographic changes are affecting family dynamics in Hawaii.

The Family Structure in Early Hawaiian Society

As isolated group of islands in the Pacific Ocean, the Hawaiian Islands and their inhabitants maintain a rich culture, history, and tradition unique as compared to the continental United States. From discovery in 1778 by Captain James Cook to its present-day society, Hawaii has evolved from a relatively homogeneous native, self-sustaining society to a melting pot of influential cultures dependant largely on imports from the mainland. Deemed as an open port by western capitalists and an opportunity for expansion and evangelism civilization by early explorers/missionaries, the islands absorbed many external influences that altered the economic, cultural, social, and political structure of Hawaii and its people.

Prior to western contact, the Hawaiian Islands were inhabited by a group of Native Hawaiians/Polynesians who cared for the land, environment, natural resources, gods, and people. In traditional Hawaiian society, the family was recognized as a communal system that engaged in the production of agriculture to maintain an overall welfare of the unit, gods, and land. The extended family in early Hawaii was composed of multiple families residing in specific districts. Each district comprised of an *ahupua'a* that included within its borders all the materials required for sustenance: timber, thatching, and rope from the mountains, various crops from the uplands, *kalo* (taro) from the low lands, and fish from the sea. All members of the society shared access to these

life-giving necessities.⁴⁸ The *ahupua'a* was the self-sustaining unit of a particular group or family unit. It was ruled by the chief and maintained by the commoners. This provided a harmonious living structure that was organized in a hierarchal system wherein *Ali'i Nui* or chiefs were the divine presence and commoners were the mass population of workers. It was the responsibility of the *Ali'i Nui* to feed, clothe, and shelter their younger brothers and sisters: the Hawaiian people. As long as younger Hawaiians would love, serve, and honor their elders, the elders would reciprocate and provide for their physical needs.⁴⁹ Similar to the family structure in the Agricultural Era of America, the Native Hawaiian's functioned not as individuals but an entity whose shared values and traditions created an extended living environment.

The living arrangement in ancient Hawaii was based on rank and location. The traditional thatched house provided shelter, storage, and a place to cook for various families within the *ahupua'a*. Residences of the Hawaiian people varied in size and use, based on class and social status. A commoner's family probably occupied only one or two structures: a sleeping house and perhaps a cooking or utility house, with an associated work plaza for *kapa* (cloth) making and other outdoor activities.⁵⁰ The higher ranked families and chiefs resided in a private complex that was comprised of several thatched *hales* or houses.

This is because separate structures had to be built for different purposes, the kapu forbidding eating and sleeping under the same roof and prohibiting men and women from eating or working together. The typical household cluster of a chief or other person of rank or position would

⁴⁸ Lilikala Kame'eleihiwa, *Native Land and Foreign Desires*, (Honolulu: Bishop Museum Press, 1992), 48.

⁴⁹ *Ibid.*, 46.

⁵⁰ Diane Lee Rhodes, "Overview of Hawaiian History," 15 November 2001, <http://www.nps.gov/history/history/online_books/kona/history1d.htm> (12 September 2008).

include one or more of the following: a common sleeping house, a men's house for eating and cooking that was kapu to women, a women's eating house, a women's work house for making mats and beating kapa, a private retreat house for women during their menstrual period, and a heiau or house temple for worship of the family gods.⁵¹

The living arrangements of traditional Hawaii and those of the US mainland during its agrarian era are comparable: both based on the production of agriculture. Multiple dwellings within a complex were constructed to accommodate the different generations and family members of the unit. Although family members did not necessarily reside under one roof, separate houses with various uses formed a communal living environment that addressed the extended family.

Hawaii's Demographic

As social and economical factors influence various changes in family life and structure throughout the nation, Hawaii has maintained a perpetuating support of the family/extended family. Families in Hawaii place significant value on their *'ohana*. It is no surprise that our households are slightly larger, we have a greater percentage of multigenerational households, and we have a high proportion of interethnic marriages. Therefore, a larger percentage of families with multiethnic and multiracial members⁵² create a unique spirit and support system base of the *'ohana*.

⁵¹ Diane Lee Rhodes, "Overview of Hawaiian History."

⁵² Rodriguez, 10.

Ethnicity

Hawaii, the melting pot of the Pacific, is a unique island chain that is composed of a diverse set of cultures, languages, and ethnicities. Hawaii represents 21.4% of the population who identify themselves as multicultural, in comparison to 2.4% nationwide.⁵³ Throughout the generations, many individuals from various racial and ethnic groups have come together to form families that represent a rich blend of mixtures.⁵⁴ Diversity can enable people to be more tolerant of other individuals who are different as opposed to a homogenous society. Living in a heterogeneous society, residents may be able to form a rich community that is acceptable of various lifestyles.

Figure 8 represents the various ethnic groups that structure the State of Hawaii. The diagram reveals that Hawaii is racially integrated and that the majority of the population is of ethnic minority. According to 2000 U.S. Census Bureau report, Asians accounted for 54.9% of the state's population, while the Caucasian group, typically the majority in the United States, accounted for only 42.5%.

⁵³ United States Census Bureau, Multigenerational Households Number 4 Million According to Census 2000, (CB01-CN.18. Washington: GPO, 2001), 1.

⁵⁴ Rodriguez, 3.

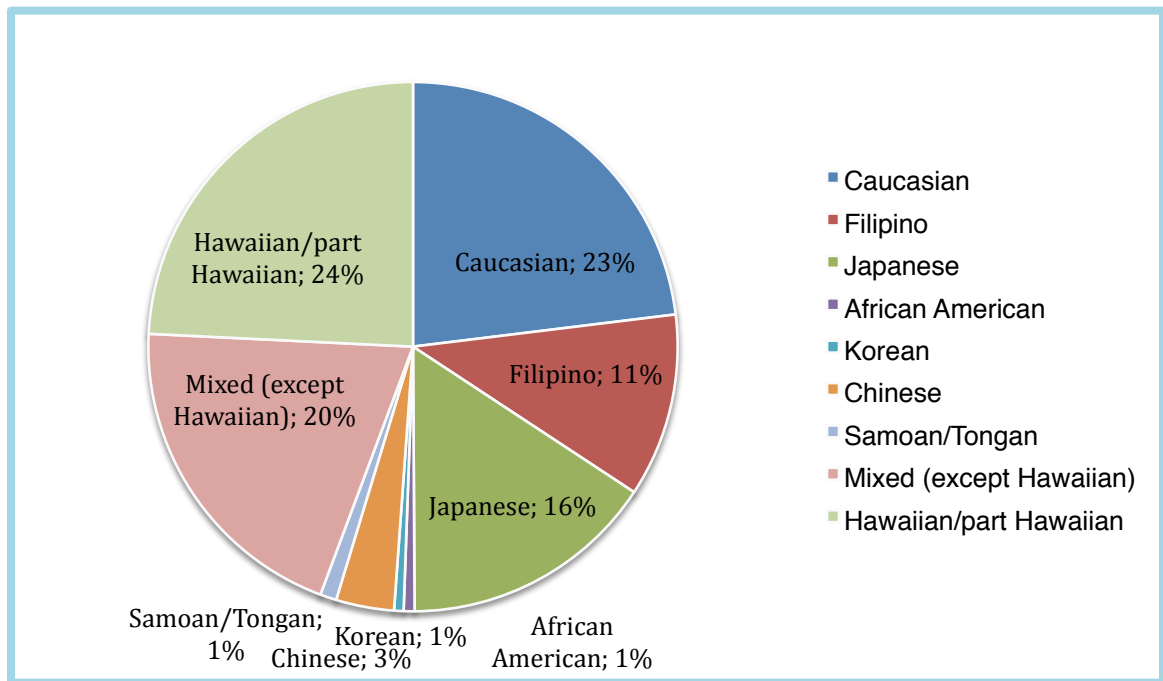


Figure 8. Ethnicities in the State of Hawaii, 2007

Source: The State of Hawaii Data Book 2007

According to the U.S. population projections, Asian Americans account for nearly 4.2 percent of the nation's population and are anticipated to increase to 10 percent by the year 2060. Not only is the Asian American population expected to increase, but it also has a high percentage of family households, particularly high rates of married-couple families, and low rates of single-parent families. In addition, the Asian group commonly resides in multigenerational extended households.⁵⁵ Since the majority of the population in Hawaii of Asian ethnic descent, discussion of the cultural value of Asian families is vital in understanding Hawaii's family composition.

As approximately 54.9% of Hawaii's population, Asian Americans contribute to the largest ethnic group in the islands. The Japanese, followed by Filipino, Chinese, and

⁵⁵ Coles, 221.

Korean ethnicities are major Asian kin groups that form Hawaii's unique multi-ethnic culture. With the annexation of Hawaii to the United States and the securing of the sugar industry, the demand for laborers to expand the economy and population brought foreign workers to Hawaii. These immigrants, largely Asians arrived in the United States in 1852, and brought their rich culture and values. It is important to note that Asian immigrants arrived in the United States as strong family groups and not as individuals. This kinship value of the family not only facilitated adjustment to new environment, but also reinforced the obligatory connection to the family unit. Strong cultural relations and kinship among Asians are significant elements for the high composition of intergenerational households. As a generalization of Asian culture, filial piety, including great respect for elderly family members, is a long admired tradition of Asians. It is generally considered that Asian American elders are accorded authority and privilege over their juniors. Asian American adult children have been viewed as conforming to parental demands and expectations, feeling more obligated to their parents, providing more financial aid to their parents, and interacting more frequently with their parents than their white counterparts.⁵⁶ Research has found that Chinese and Japanese American parents were more likely to live in three generational households than their white counterparts and that many displayed their own cultural traditions of filial obligations.⁵⁷

Marriage and Divorce

Marriage in Hawaii remains stable. The average age at marriage in Hawaii is between 25-30 years. This mean age in comparison to 30 years ago is above the average—the average being in the early twenties. The pursuit of higher education and

⁵⁶ Coleman, 377.

⁵⁷ Ibid., 377.

career development may be a possible explanation for the delay in marriage, especially for women. A greater acceptance of premarital cohabitation, as evidenced by a significant increase in unmarried-couple households in the latter part of the century, may also have contributed to the increase in age at first marriage.⁵⁸ As a result, the increase in age for marriage among men and women in Hawaii can be perceived in a positive light. Marriage later in life may facilitate greater opportunities for couples to become financially and socially stable to maintain a comfortable lifestyle.

In the last decade of the twentieth century, the number of female-headed families in the United States increased by nearly 27 percent, from 6 million in 1990 to 7.6 million in 2000. The shift from two-parent to one-parent families seen in the last 30 years has been driven by several demographics.⁵⁹ These trends include unexpected pregnancies, divorce, and non-marital births. The divorce rate in Hawaii remained relatively the same.⁶⁰ At a 4% divorce rate, Hawaii is of comparable average with the nation. This demographic shift on the family level is a major element that increases the need for multigenerational homes. When parents decide to separate, changes in social and economic status occur. Families are placed in a personal predicament because moving to a new location or home creates new needs. Individuals who choose to move back to their parents' home initiate a new lifestyle and create homes that include multiple generations. Therefore, homes need to be more adaptable and able to respond to specific situations.

⁵⁸ Rodriguez, 2.

⁵⁹ Ibid., 4.

⁶⁰ Ibid., 5.

General Population

According to the U.S. Census Bureau, Hawaii is ranked 10th in the nation for population growth. This steady growth is associated with consistent migration, low unemployment rates, and stable economy. Table 6 portrays the increase in Hawaii's population over a 16-year period. The projection foresees a continuation of a trend in Hawai'i that already has been widely noted: mortality continues to decline; therefore, the population is aging. The proportion of people age 65 or older is increasing, while the proportion of those 18 to 64 is decreasing⁶¹. This increase in population will demand more housing—housing that is able to accommodate the various age groups.

Table 6. Total Population of Hawaii and Honolulu

	State of Hawaii	County of Honolulu
1990	1,113,491	836,231
1992	1,158,613	863,959
1997	1,211,640	886,711
1999	1,210,300	878,906
2000	1,212,125	875,377
2003	1,248,200	890,818
2004	1,262,124	893,614
2005	1,275,194	899,296
2006	1,287,022	903,028

Source: U.S. Census Bureau

The Elderly Population

Respecting and caring for elders is a traditional value that resonates with families in Hawaii. It is the child's devotion and obligation to care for their parents in time of need. It is this moral concept of filial piety that is embedded within traditional Asian

⁶¹ Hawaii Sustainable Task Force, Hawaii 2050: Building a Shared Future, (Honolulu: Hawaii Sustainable Task Force, 2007), 34.

culture and Hawaii's society that emphasizes treatment of our elders. By the year 2020, every fourth person in Hawaii will be 60 years or older.⁶² According to the Center on the Family at the University of Hawaii, people in Hawaii have a longer life expectancy than those across the nation. This also holds true for some 238,000 current Hawaii residents that are 60 years and over. They constitute 18.7% of Hawaii's total population, slightly higher than 16.8% in the nation.⁶³ Table 7 explains the population and life expectancy of the older generation in Hawaii. Adults 60 years and older are considered in this demographic table. The data reveals that seniors in Hawaii have a higher life expectancy than their counterparts on the United States mainland. This is a significant ratio that needs to be appropriately addressed due to its impact on future social and economical factors of the family unit.

Table 7. Population and Life Expectancy of the Older Adult in Hawaii

	United States	Hawaii
Percent of residents aged		
60 and over	16.8	18.7
65 and over	12.4	13.7
85 and over	1.7	2.2
Life Expectancy (in years)		
All residence	76.9	79.8
Male	74.1	77.1
Female	79.5	82.5

Source: Yuan, Karel, and Sarah Yuan. [Hawaii's Older Adults: Demographic Profile](#).

Household Composition and Demand

Delays in marriage, the increase in single-parenthood, and divorce have affected household and family composition. It is not surprising that the average household size

⁶² Karel Yuan, and Sarah Yuan, [Hawaii's Older Adults: Demographic Profile](#), (Honolulu: University of Hawaii: Center on the Family, 2007), 2.

⁶³ Yuan, 2.

has decreased over the past 30 years. In Hawaii, the average household size remained relatively unchanged at the state and county levels.⁶⁴ The U.S. Census Bureau indicated that in Hawaii, the average household size in 2000 was 2.92 persons. The average household size was only slightly higher than the rest of the nation (average household size 2.63), perhaps due to the high occurrence of multigenerational households in Hawaii.⁶⁵

Table 8 compares the average household type in Hawaii to the national level. The table reveals that Hawaii has a slightly higher average of married-couple, female-headed, and male-headed households. The averages validate Hawaii's cultural view of the family. The table also reveals higher averages in multiple nonfamily households, unmarried partner households, and multigenerational homes.

Table 8. Households and Families in the United States and Hawaii

	Percent of Households in 2000									
	Family Households						Nonfamily		Unmarried	Multigen
	Married		Female		Male		One person	Multiple person		
	Total	With children under 18 yrs.	Total	With children under 18 yrs.	Total	With children under 18 yrs.				
United States	51.7	23.5	12.2	7.2	4.2	2.1	25.8	6.1	5.2	3.7
Hawaii	53.6	24.0	12.4	5.9	5.2	2.2	21.9	6.9	5.8	8.2

Source: U.S. Census Bureau

According to the 2006 Housing Policy Study prepared by the Hawaii Housing Finance and Development Corporation, nearly 60% of Hawaii's 435,818 households are homeowners. About 65% of all households were living in single-family detached

⁶⁴ Rodriguez, 5.

⁶⁵ Ibid., 5.

dwelling units. 17% were renting apartments and about 10% owned or rented condominium units. Most of the remainder occupied multifamily units.⁶⁶ As indicated in the study, the need for housing is dependent on the increase in population. However, with the economy's unemployment rate at a low level, Hawaii's household incomes have increased—the U.S. Census Bureau reported Hawaii's median household income in 2005 at \$58,112, up 14.4% from \$50,787 in 2003⁶⁷, creating unaffordable housing that does not respond to the median income level. Table 9 validates the need for a new housing type that is affordable and meets the needs of family preference. The Hawaii Housing Policy Study stated that in 2006, the preferred number of bedrooms and baths was lower than the past, perhaps a reflection of a willingness to settle for smaller units in the face of high prices.⁶⁸ This paper proposes an intervention in Hawaii's housing market: a mixed-use, multigenerational urban complex that will address the current social and economic situation and establish housing for the average/extended family.

Table 9. SMS Hawaii Policy Study: Buyer and Renter Preferences (2006)

	Buyer	Renter
Housing Type		
Single-family	83%	49%
Apartment/Condominium	53%	43%
Unit Type		
Studio	--	42%
1-Bedroom	43%	37%
2-Bedroom	49%	20%
Size		
> or < 1.5 baths	90%	83%
> 1500 sq. ft.	39%	22%
< 1200 sq. ft.	38%	38%

⁶⁶ Hawaii Housing Finance and Development Corporation, 2.

⁶⁷ Ibid., 2.

⁶⁸ Ibid., 20.

'Ohana Zoning

To sustain the concept of *'ohana* throughout the islands, a zoning ordinance was formed in 1980 by Eileen Anderson (during her first mayoral campaign) to assist families to purchase affordable individual living quarters and at the same time, to encourage the preservation of the extended family.⁶⁹ Recognized through all Hawaiian Islands, the *'Ohana Zoning* law permits homeowners—under specific provisions—to build a second dwelling on their property. This second dwelling can take the form of an attached or detached single-family home on an existing residential lot, provided that it meets all applicable building codes. Section 1 of the *'Ohana Zoning Act*, describing the purpose of the housing ordinance, indicates two primary goals: To assist families to purchase housing, and to encourage the preservation of the extended family:

The legislature recognizes that the spiraling costs of housing, the limited availability of land for housing, and the failure of wages to keep pace with inflation, contribute to the inability of many families to purchase their own homes. The legislature also recognizes the resulting trend of children living in their parent's home even after reaching adulthood and after marriage. This trend has positive and negative aspects. The situation is negative when it is forced upon persons because there is a scarcity of affordable homes. The trend can be positive, however, because it helps preserve the unity of the extended family.⁷⁰

During an era where majority of families are living the nuclear lifestyle, the establishment of the *'Ohana Zoning* was a way to maintain the family core of the

⁶⁹ Susan Ekimoto Jaworowski, *Ohana Zoning: A Five-year Review*, (Honolulu: Legislative Reference Bureau, 1988), 1.

⁷⁰ *Ibid.*, 4.

household through the construction of additional living spaces, giving more reason for family members to stay. However, a contradiction in implementation of the law allowed unrelated members to reside in the “*Ohana* home.” Since this zoning ordinance was intended for the extended family of the existing household, the additional dwelling should be limited to family members only. Restricting these homes to only extended family will reinforce Eileen Anderson’s initial concept of preserving generational living.

One way to handle an extended family requirement could be to require a family member to reside in the unit for a fixed number of years, and then permit occupancy by anyone. This type of requirement would help to ensure that ‘ohana units are constructed initially for an approved purpose, yet would not be so restrictive as to discourage families and financial institutions from expending the moneys to build the units.⁷¹

The table below describes few of the ‘*Ohana* Zoning provisions with which families need to comply.

Table 10. ‘Ohana Zoning Provisions

- Minimum roadway width of 16 feet
- Maximum Lot coverage
 - No more than 50% of the zoning lot may be covered with building or other structures. These include dwellings, carport, garages, balconies, sheds, etc.
- Setbacks
 - R-1 Front: 30’ Side/Rear: 15’
 - R-2 Front: 30’ Side/Rear: 10’
 - R-3 Front: 15’ Side/Rear: 6’
 - R-4 Front: 10’ Side/Rear: 5’
 - R-5 Front: 10’ Side/Rear: 5’
 - R-6 Front: 10’ Side/Rear: 5’
 - R-7 Front: 10’ Side/Rear: 5’
- Height Limits of 15 feet wit a maximum height limit of 25 feet above the highest buildable point on the lot

⁷¹ Jaworowski, 64.

- Parking
 - New 'Ohana unit will need two spaces

Source: Ohana Housing: A Guide to Adding a Second unit on your lot

Reflection

In Hawaii, the extended family (all blood-related family members) represents a spirit, a bond that maintains that family unit. Understanding the influential factors and the given diverse backgrounds of today's local people reveals the reason for Hawaii's being first place in the United States for extended households. This extended/generational lifestyle is widely accepted because of the rich multicultural economy that thrives in Hawaii.

With the increase in population, higher life expectancy in Hawaii, and soaring housing demands, 8.2% of families are uniting in multigenerational homes to curb these affects. The concept of family being the ideal value among Hawaii residences, the integration of generations is a way to adhere to traditional practices/value. Asian Americans and Hawaiian ethnic groups, strongly appreciate the extended lifestyle. In Hawaii, the extended lifestyle reveals the strong connections to our society and culture, and the value placed on the *'ohana*.

CHAPTER 4. INTERVIEWS

The subjects for this study were selected based on ethnicity and current living arrangement, primarily families residing in a household with three or more generations. Various ethnicities were interviewed to attain a comprehensive study that concentrated on the diverse social fabric of Hawaii. Japanese, Chinese, Filipino, and Hawaiian descendants were interviewed to reveal their personal perspective on living in a multigenerational household. The interviews also obtained qualitative data for analyzing and understanding the complex social/living arrangements of generations. The interviews consisted of three major sections: background of the family, the multigenerational lifestyle, and design, which was formatted to extract as much information on multigenerational living as possible. Interviews were conducted in a face-to-face method to establish a personal connection with the subjects. The goal for conducting these interviews was to find out how families think and react to issues in a multigenerational living arrangement. All candidates for the thesis were contacted and requested to be participants in the study.

Seagull Schools, located in the Kapolei District of Oahu, was the inspiration and design source for the research. As a non-profit organization, Seagull Schools provides early childcare and adult care programs that perpetuate harmony and mutual support between generations. The study's purpose was to further enrich the research and to evaluate and promote the necessity for early education and adult care programs for communities in Hawaii. The Kapolei Director was interviewed regarding her personal experience in a multigenerational home and on the day care programs offered to families across Hawaii. Observations and analysis of the school's integrated child and adult care programs were performed.

Multigenerational Family Interview Summaries

See Appendix B

Multigenerational Interview Summary Chart

The multigenerational families were interviewed with questions from Appendix B.

The findings are visually represented in Table 11 below. Organized in three sections-- background of the family, lifestyle, and design—the table reveals similarities and differences among the seven interviewed families.

Table 11. Multigenerational Interview Summary Chart

		Family A	Family B	Family C	Family D	Family E	Family F	Family G
Background	Number of generations	3	3	4	3	3	3	3
	Years in existence	9 months	10 years	50 years	5+ years	?	6	25 years
	Reason for existence	Grandmother	Daughter	Grandparents	Daughter	Grandparents	Immigrants	Father
	Living arrangement (Permanent or Temporary)	Permanent	Temporary	Permanent	Temporary	Permanent	Temporary	Permanent
Multigenerational Lifestyle	Is your home a reflection of your lifestyle?	Yes	No	No	No	Yes	No	Yes
	Challenges							
	None	x						
	Privacy		x			x		x
	Space		x		x	x	x	x
	Cultural							
	Social			x				
	Design		x		x	x	x	
	Other		Noise		Association	Noise	Organization	Noise
	Benefits							
	None							
	Caring for Adults	x	x	x	x	x	x	
	Caring for Children	x	x	x	x	x	x	
	Stronger Relationships	x	x	x	x	x	x	x
	Affordable		x	x	x	x	x	x
	Other							
	N/A							
Reason for highest in nation	Cultural	x	x	x	x	x	x	x
	Social	x	x		x	x	x	x
	Economical	x	x		x	x	x	x
	Other					Limited Land		

		Family A	Family B	Family C	Family D	Family E	Family F	Family G
Design	How important is personal space? (scale: 1 less important – 10 very important)	10	10	10	7	10	6	7.5
	Important spaces in the home							
	None							
	Kitchen	x		x	x	x	x	
	Living Room		x	x		x	x	
	Dining Room						x	
	Bedroom	x	x	x		x		x
	Bathroom	x						
	Outdoor	x	x		x		x	
	Other	Office			Garage			Exercise room
	Gathering Spaces							
	None							
	Kitchen		x	x	x	x	x	
	Living Room	x	x	x	x	x	x	x
	Dining Room		x					x
	Bedroom							
	Bathroom							
	Outside	x	x		x	x		x
	Other				Garage			
	Studio							
	Unit Type							
	1-Bedroom							
	2-Bedroom							
	3-Bedroom		x		x	x	x	x
	4+ Bedroom	x		x				
	1-Bath							
	1.5-Bath						x	x
	2-Bath		x		x	x		
	2.5+ Bath	x		x				
	Other						Townhouse	
	None							
	Spaces to change for more adaptability?							
	Kitchen			x		x	x	
	Living Room		x			x	x	
	Dining Room						x	
	Bedroom		x			x	x	x
	Bathroom						x	
	Outside							
	Other	Noise	Storage					Additional floor

Multigenerational Interview—Lifestyle

Results of the interviews conducted conveyed a importance on the cultural emphasis on family caring and high cost of living as sources for extended households.

These families illustrate that the establishment of multigenerational households is becoming increasingly accepted throughout Hawaii because of its affordable solution to inconvenient problems—high cost of living, care and lack of affordable housing.

Especially in the case of long-term care, many families perceive the extended household as an efficient answer to this rising concern.

Due to Hawaii's majority ethnic minority population and high cultural emphasis on family, multigenerational households are maintaining a standard of life that focuses on strengthening family relationships. In Asian and Hawaiian cultures, it is traditional family

practice for several generations to reside in a single household. The intrinsic value of the family is inherent in the concept of *'ohana* that thrives across the Hawaiian Islands. It is imbedded in the culture to care for elders, family members, and friends. A common response among the interviewed families when asked the question about their personal perspective on the multigenerational lifestyle was that the extended household is a way to preserve cultural identity as well as regulate the high cost of living in the islands. It was inspiring to recognize the value that these families place on caring for each other. Many of the interviewers were sons or daughters taking care of their parents. These families stated that love for their parents is the motivating factor for taking them within their home and a way to pay respect. Known as filial piety, it is a traditional obligation for children to care for elders and adults. This concept is widely practiced among families in Hawaii. Culture is a major factor responsible for Hawaii's being identified as the highest state with multigenerational households.

Other positive views on the multigenerational household include: a living arrangement that provides for care of children and elders, one that addresses the rising cost of living, and an effective way for transitioning to a new country. In the case of Family B, the extended household provided the daughter with means for an affordable place to live with inexpensive child care/support by her parents. The daughter of Family B explained that the benefit to this type of housing arrangement is not only about affordability, but that her daughters will have daily interaction with their grandparents. The unconditional love from the grandparents combine with youthful mentality of the children to create a nurturing environment. The extended household provides a possible solution in tackling the dramatic shifts occurring in America. However, Family F perceived the extended household as a solution for adaption. Arriving from the Philippines, Family F sought out living in a multigenerational home to ease the transition

from one country to another. Extended household living is a common tradition in Asian families, but also temporary extended households serve as a strategy for adjustment and financial stability among recent immigrants. Foreign-born Americans have a much higher rate of utilizing extended households than do native-born Americans; and their use of extended households has increase over the past 40 years.⁷²

Challenges within the multigenerational home include privacy, space, stress, noise, and multiple family dynamics issues. Family A, explains that the multigenerational lifestyle is not for everyone; such a lifestyle can cause unbearable stress for family members. The extended household is a complex living situation. Generational and personality differences are major issues that lead to problems living together. In the case of Family B, a prevalent challenge is accommodating the daily routines of each family member. Family B adjusted to the extended lifestyle by creating a schedule. With four adults, one child, and one toddler, chaos could have prevailed if a daily routine/schedule had not been implemented. Family B: the parents, their son, their daughter and her two children, —explained that in the morning, the daughter will wake up early to take a shower and get ready for work while the parents assist her children to get ready for the day/school. When the daughter is finished her morning routine, the roles are reversed as the daughter watches, feeds, and transports her older child to school. Thereafter, the son and parents prepare for the day and or work. One grandparent gets ready while the other watches the toddler. During the evening, the children are bathed while the adults assist in cleaning the house and preparing dinner. The children eat first and then the adults in order to accommodate the children's early sleep schedule. After the children are asleep, the adults branch off into their own

⁷² Coles, 66.

individual routines. This daily schedule is successful for Family B. Organizing their schedule to accommodate the children provides a focus on their needs by close monitoring. Each individual has a specific role and obligation to the overall unit. Understanding and having a regulated schedule improves how the family functions as a kin group in a living arrangement.

The multigenerational household accommodates several individuals with different personalities, responsibilities, and preferences. At the conclusion of each family interview, the following questions were asked: What advice would you give a new family who are considering life in a multigenerational home? How would you establish a successful living environment for all? It is important to note that in the successful extended household, communication is the key element. Communication with all heirs and written agreements are necessary procedures that should be enforced in the early stages of the decision process and as an underlying contract for living with each other. Consolidating and advising all living/financial agreements will ease the transition; and hopefully, this action will create a healthy environment for all generations.

Multigenerational Interview—Design

Many challenges in an extended household environment are from inadequate and inflexible living spaces. What seems quite evident is that the housing market today, based for the most part on a stereotypical standard family, bears very little relation to the plurality of an urban reality characterized by the constant influx of new population with different languages and cultures. The current diversity of social groupings less stable employment, and the rapid development of computer technologies among other factors,

have revolutionized not only our working lives but have altered our domestic habits,⁷³ These elements are directly affecting how families are living within their personal habitation. So how are homes adapting to the multigenerational lifestyle? A common response is that many families establish multifunctional spaces. Creating multipurpose spaces/rooms efficiently maximizes the limited space within a traditional single-family dwelling. This design strategy allows for future adaption to take place. A single space can function as sleeping quarters or a gathering space. In the case of Family B, the living area serves as a gathering space during the day and a bedroom at night. The reason for this dual usage is that it is the most comfortable space in the house

An elemental design criteria among interviewed families was personal space where the individual can relax and retire from the hectic extended lifestyle. The interview showed an average of 8.6 out of 10, considered personal space as important. Bedroom and bathrooms are key spaces for privacy. Offices are also personal spaces are essential for concentration and allow the living area of the house to be clear for communal gathering. However, the majority of the homes of families interviewed were of a three-bedroom, two-bath unit type. To accommodate a family size of six or larger, a typical three-bedroom/ two-bath home does not provide adequate space. As a solution to achieve comfort within a multigenerational home, additional bedrooms and bathrooms are desired to comply with the extended lifestyle.

In the case of Family A, the family decided to design an extension to their existing home to create privacy. As a requirement by the grandmother, a separate living unit was developed. The grandmother's space is attached to the existing four-bedroom, two-bath house. This extension consists of a bath, living, laundry, dining, and kitchen

⁷³ Gustau Galfetti, Model Apartments: Experimental Domestic Cells, (Barcelona, Spain: Editorial Gustau Gili, 1998), 10.

areas. An adjoining space between the existing home and newly developed grandmother's living zone, functions as the family's gathering space. "We share the space that was created by the attachment. Instead of a five-foot hallway, we have a new room between the existing house and Grandma's space."⁷⁴

Family D entertains their extended family every weekend; they like to gather in a large comfortable space but the living room is too small. As a solution to the space issue, the family utilizes the garage as the main area for gathering of family and friends. The family would like to use the garage as additional living space for everyday use; but the district association prohibits the garage door to be open unless the family is cleaning or having a party. As an extended family that enjoys entertaining others, the family stated that a comfortable space for gathering is a design criterion essential in a residence in Hawaii and especially for multigenerational families. The interesting element in this interview is that Family D focused on adaptable spaces. They used the garage space not only as a carport but adapted into a storage area and gathering space for friends and family.

Family F is composed of a large extended family structure. Emigrating from the Philippines, the 10-member family resides in a 3-bed, 1.5-bath home. Revealing a strong case for adaptability, Family F indicated that their home is not a reflection of an efficient multigenerational household. "Each family sleeps in one room. Our family consists of four people. Another room has four people and another has two. We make do with the spaces we have and it's enough for us since we are all working majority of the time."⁷⁵ Another challenge that the family identified was the lack of bathrooms in the house. When multiple members try to get ready for the day, the number of bathrooms is

⁷⁴ Family A.

⁷⁵ Family F.

important. Scheduling specific times in the morning for each family member ensures optimal organization. The living environment of Family F suggests the need for a home to be adaptable and accommodating to the various lifestyles of each individual. As a positive experience in the family's extended lifestyle, the multigenerational household creates closer relationships between family members and a secure environment for nurturing children and one another.

Important spaces in the home, according to the interviews, are the kitchen, living, bedroom, and outdoor spaces. These areas are viewed as essential because they are where all the families gather and spend the majority of their time. Large spaces that can comfortably fit everyone are vital to the extended family.

Seagull Schools, Kapolei, Hawaii—Mixing of Generations



Figure 9. Seagull Schools, Kapolei, Hawaii

Image (L): Classroom

image (R): Outdoor play area for children

Seagull Schools is a private, non-profit corporation that has been serving communities by developing and operating early education facilities since 1971. It is one of the state's largest childcare providers, serving approximately 800 children from mixed socio-economic backgrounds. The School's centers are located in Kailua, Ewa Beach,

Kapolei, and Honolulu, on the island of Oahu, and at the Mauna Lani Resort on the island of Hawaii.⁷⁶

Among Hawaii's finest early childcare center, Seagull Schools is committed to provide not only high quality education, but also a stimulating environment where social skills are nurtured. Early childcare programs are essential services for parents (especially working adults) and for the child's developmental growth. Seagull Schools offer day care programs at costs that are among the lowest in the State and also provide generous financial aid to low-income families for tuition assistance.⁷⁷

A unique and integral element at the Kapolei location is the mutual program of child and adult care services. This integrated center encourages the young and mature to support one another through daily interaction. The discrepancy in ages between generations is clearly visible but the reciprocal benefit of interaction between each social group closes and negates the age gap. Mutual care provides a cooperative environment that alleviates social exclusion.

Analysis on the Intergenerational Program and Benefits of Mixing Generations

The intergenerational day care program at Seagull Schools at Kapolei helps families care for their young and aging dependents by providing high quality day care services. The school continuously seeks to make child and elder care both accessible and affordable.⁷⁸ This program is essential in resolving the growing disconnection between seniors and children.

⁷⁶ Seagull Schools, 25 Nov. 2008 <<http://www.seagullschools.com>>.

⁷⁷ Seagull Schools, <<http://www.seagullschools.com>>.

⁷⁸ *Ibid.*

According to a survey completed by the AARP, 45% of grandparents live more than 200 miles away from their grandchildren. With an increasing disconnect between the generations, programs such as intergenerational day care centers fill the void by providing an environment for socialization and engagement. Intergenerational centers provide numerous benefits to older adults and younger children. For seniors, these programs provide a way to reconnect with children and become a significant role model in the child's development. These centers provide a nurturing environment that not only focuses on their health needs but also addresses social and emotional skills that promote personal engagement in society. In the case at Seagull School at Kapolei, Hawaii, few seniors view themselves as either a burden to their families or to society because they are not contributing daily with household chores or because they are unable to function due to disability. Mixing generations has assisted in creating a place for dissolving the age gap and provides a safe space for improving mood, activity level, interests, and interaction of seniors.

Intergenerational programs are vital not only to elders, but to young children as well. Children in present society are surrounded with technological advancements that are detaching them from traditional values of the family. Tracie Kam Romualdo, the Director of Seagull Schools in Kapolei, sees the modern day child as rambunctious and disengaged from their elders. Intergenerational programs such as the one at Seagull School provide an interactive learning environment to improve social and behavioral skills. The mixing of generations allows for children to be engaged, exposed to older adults, different lifestyles, and age groups. This engagement strengthens developmental growth, self-esteem, and the ability to interact. It was noted that children in close interaction with elders average 11 months ahead in development than children in the regular child daycare system.

The visit to the intergenerational day care center at Seagull Schools in Kapolei provided a better understanding of the positive value in mixing generations. The concept of generational interaction proves successful in both the physical and emotional realms. Allowing for this type of interaction within the home provides an environment that is beneficial to all. Designing a multigenerational home that reflects this coexistence is imperative to success.

CHAPTER 5. ANALYZING THE MULTIGENERATIONAL LIFESTYLE

The multigenerational household consists of three or more generations residing under a single roof. The United States 2000 Census cited the existence of 3.9 million multigenerational family households. This extended living situation represents approximately 4% of all homes in the nation. According to Generations United—a national organization that implements public policies, programs, and resources to strengthen family bonds across the United States—the most common type of multigenerational household is composed of grandparents living with both their children and grandchildren. This form of the family unit accounts for nearly 65% of all multigenerational households (nearly 2.6 million households) across the United States. The two other major multigenerational living arrangements identified by Generations United are homes in which grandparents live with their children and their children's children (comprising of 1.3 million households), and families that include grandparents living with their parents, along with their children and their grandchildren. The latter accounts for 2% of multigenerational households.⁷⁹

As a growing U.S. trend, larger percentages of grandparents are now responsible in varying degrees, for the care of their grandchildren and even assume financial responsibility for food shelter, clothing, and day care. Nationally, 42% of grandparents living with their grandchildren are responsible for their care. In Hawaii that percentage is

⁷⁹ Generations United, "Fact Sheet: Multigenerational Households," Generations United, July 2006, <http://www.gu.org/documents/A0/Multigenerational_Families.pdf>, (12 Nov. 2008).

smaller; 28.5% of grandparents living with their grandchildren assume responsibility for their care.⁸⁰

In this chapter, the lifestyle composition of the multigenerational home is analyzed to identify the evolving needs of each generation. Understanding and recognizing the prevalent challenges and benefits of multigenerational living, families will be able to successfully adapt to this type of shared living environment. Further study on the needs and social dynamics of each generation, benefits and challenges, and a personal point of view on multigenerational living are presented to reinforce the need for this type of housing.

Understanding the Dynamics of Each Generation

With the present economic challenges faced by many, a rearrangement of family life in America is occurring. This change is producing a modern family household that is composed of generations. In what is known as the extended family, parents, children, and grandparents have decided to live together in one dwelling to create a household of multiple generations.

In a revitalization of pre-War World II living, the extended family today is adapting to the dramatic societal shifts by creating a healthy living environment of mutual support. Sustained by multiple generations within the family, the multigenerational home provides numerous rewards. There is an emotional closeness that often forms with physical proximity.⁸¹ When three generations or more live together, each family member upholds a specific function. Grandparents become mentoring figures to their grandchildren and children. Grandchildren nurture grandparents; in turn they learn patience and are more

⁸⁰ Rodriguez, 6.

⁸¹ Generations United, 2.

perceptive with their peers. The remaining household members offer assistance with daily household activities, as well as social and financial support. The table below represents a generalized analysis of the multigenerational household composition. Identifying five generations— Silent Generation, Baby Boomers, Generation X, Generation Y, and Generation Z—and their specific roles and values addresses the dynamics of the multigenerational lifestyle. Exposing age dynamics allows for a comprehensible approach in understanding the various needs of the individual and the group while providing a way to bridge the generational gap.

Table 12. Generational Dynamics

SILENT GENERATION		
Who are they?	Role	Generational Specific Design Principles
<p>Born between the two World Wars (1925-1941)</p> <p>Influences World War I and II</p> <p>Traits Traditional values Respectful Loyal Passive</p>	<p>“Symbol of continuity and stability in family ritual and values”</p> <p>Caregiver</p>	<p>Universal Design Accessibility</p> <p>Rooms with specific functions to their needs Larger/adaptable areas for comfort, access, and support</p> <p>Personal space/living quarters</p>

BABY BOOMERS		
Who are they?	Role	Generational Specific Design Principles
<p>Born after World War II (1946-1964)</p> <p>Influences Television</p>	<p>Nucleus of family</p> <p>Caregiver</p> <p>Provider of household</p>	<p>Provide for adaption Universal design Retirement Empty nesters</p> <p>Recreational spaces</p>

Traits Personal gratification Optimist Active		Functional spaces that are flexible Kitchen/Dining Living Sleeping Work space
---	--	---

GENERATION X		
Who are they?	Role	Generational Specific Design Principles
Born 1964-1980 Influences Technology Traits Focus on money Savvy	Provider Child-rearing age	Private spaces Bedrooms with walk-in closets Family-focused areas Kitchen/dining Living Office space

GENERATION Y		
Who are they?	Role	Generational Specific Design Principles
Born 1981-1999 Influences Technology Internet Traits Realistic Open minded	Supporter	Private spaces Study areas Communal/entertainment areas

GENERATION Z		
Who are they?	Role	Generational Specific Design Principles
Born 2000-Present Influences Digital age Traits “Digital Native”	Future	Healthy/Interactive learning environments Outdoor/play areas

As noted in the table, the multigenerational household is composed of several unique and distinct individuals. These unique generational characteristics have been influenced by specific cultural and historical events. Each generation—from the Silent Generation to Generation Z—maintains an exclusive identity, but coexists with other individuals that are born at that specific period. These generational factors contribute to and greatly impact family dynamics within the extended household. Understanding generational dynamics allows for recognition of a universal environment that can accommodate various lifestyles and enable members to age in situ.

Benefits and Challenges

The multigenerational household is a complex social living environment that provides many benefits and challenges to all family members. Table 13 describes the different benefits and challenges in living a multigenerational lifestyle.

Table 13. Benefits and Challenges

Benefits

- Affordable
 - Housing—accommodates more people
 - Saves money
 - Child and Elderly Care
- Influential
 - Grandparents teach grandchild about values and traditions
 - Grandchildren receive unconditional love
 - Moral support
- A solution to societal, economic, demographic situations
- Strengthen family ties
- Maintains cultural beliefs
- Facilitates in transition (divorce, single parent, immigration)

Challenges

- Personality differences
- Lifestyle differences
- Privacy issues
- Noise
- Lack of space or flexible spaces
- Lack of identity
- Home design

Living in a multigenerational home encourages social and economical support. Whether by choice, necessity, or being born into it, the extended lifestyle celebrates the family. As a habitation of multiple family members and generations, this type of living environment further produces a continuum of care. Sharon Graham Niederhaus and John Graham, authors of *Together Again: A Creative Guide to Successful Multigenerational Living*, state that parents of young children may receive help with child care from grandparents. The grandchildren obtain gifts of time, unconditional love, and attention from their grandparents. In turn, grandparents get emotional satisfaction from more frequent interaction with their grandchildren and from the responsibilities of helping them. There is an emotional closeness that often forms with physical proximity. Other studies have shown positive outcomes for older adults who engage with children: less depression, better physical self-care, and a reported sense of purpose. Children are less likely to stereotype older adults or to fear aging.⁸²

In difficult or trying economic times, affordability is an elusive goal toward which many families are striving. The multigenerational lifestyle provides a way to minimize cost of living and care. Multiple family members provide income for the group to enhance family accommodations and provide combined financial benefits.

⁸² Generations United, 2.

Challenges and issues are prevalent in an extended living environment. The multigenerational household sustains various challenges due to a living arrangement that contains multiple sets of ages, personalities, and characteristics. As Niederhaus and Graham state, the extended family living will not work for everyone; some folks just cannot get along because of the mix of personalities.⁸³

Issues in the multigenerational household include relationship, personality, lifestyle, privacy, and design issues. Individual personalities and lifestyle preferences can make a huge difference in the ease with which people live together.⁸⁴ Problems may occur when several individuals with differing personalities and needs reside in a contained space. As with any situation, challenges must be addressed to facilitate a positive outcome. In the case of the personal surveys conducted on multigenerational families in Hawaii, a number of families indicated that to alleviate misunderstandings and personal distress, goals, planning, and communication are vital.

Dwelling—Issues

The standard home can be visually interpreted as an enclosure of permanent walls and structure (four walls and a roof) with defined interior spaces. This translates into a static refuge of inflexible living spaces that disregard occupant needs and the dynamic nature of humans. Accommodating change in residential design requires the anticipation of present and future family needs. Flexibility in housing is not a new concept; it is an essential design solution to be implemented in housing developments today. Flexible housing can adjust to changing needs and patterns, be they social, personal, practical, or technological. Changing patterns might be demographic,

⁸³ Graham, 278.

⁸⁴ Ibid., 254.

economic, or environmental. Flexible housing, therefore works throughout the life of a dwelling.⁸⁵

As a result of the personal interviews in the study conducted in Honolulu, a general analysis of design issues and the multigenerational family was revealed. Formulating and analyzing the issues within the living space and household provided a comprehensive approach to evoke innovative design solutions. The design issues that were gathered focused on the inadequacies of the families' current living arrangements. Figure 9 below represents a standard 3-bedroom, 2-bathroom home. It is a common housing typology among the families interviewed. Blue indicates private space; purple highlights shared areas.

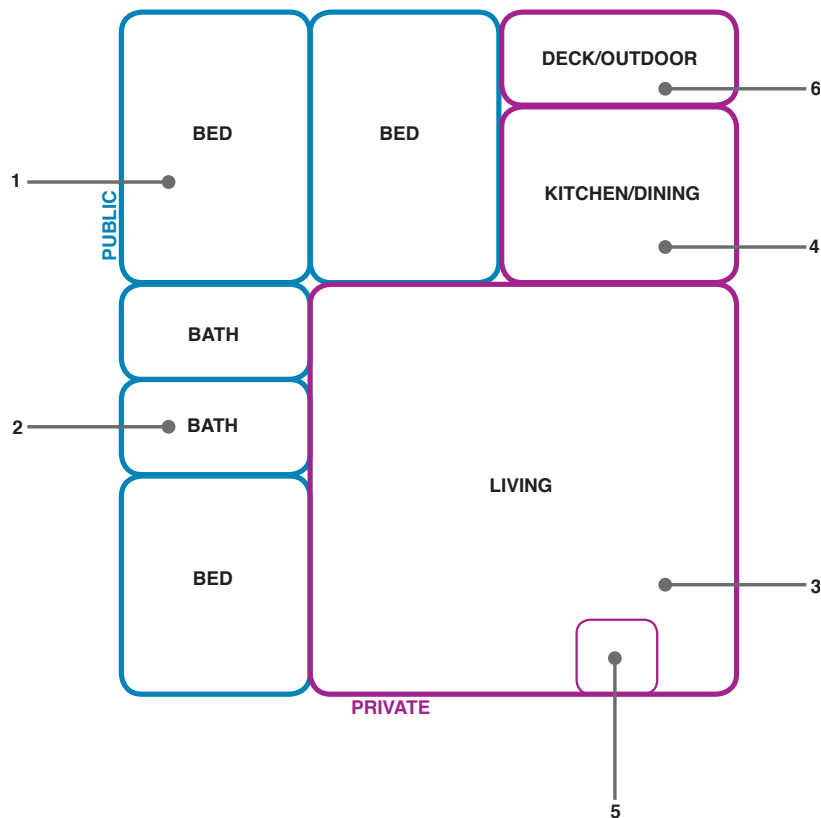


Figure 10. Design Issues—Floor Plan

⁸⁵ Schneider, 4.

Table 14. Design Issues

<p>1. Bedroom (private component)</p> <ul style="list-style-type: none">• <u>Activities</u><ul style="list-style-type: none">○ Sleep○ Work/play/entertain• <u>Issues</u><ul style="list-style-type: none">○ Maintaining privacy○ Lack of adaptability<ul style="list-style-type: none">▪ Take into consideration of individual growth pattern & generational differences (children-teen-adult, play-work, sleep-communal)○ Lack of space○ Lack of storage○ Accessibility	<p>2. Bathroom (private component)</p> <ul style="list-style-type: none">• <u>Activity</u><ul style="list-style-type: none">○ Personal hygiene• <u>Issues</u><ul style="list-style-type: none">○ Lack of bathrooms○ No adaptability—to daily needs/schedules and routines of family members○ Accessibility—aging group	
<p>3. Living Room (communal component)</p> <ul style="list-style-type: none">• <u>Activities</u><ul style="list-style-type: none">○ Social/communal gathering○ Work/play/entertain• <u>Issues</u><ul style="list-style-type: none">○ Lack of defined spaces—personal activities○ No adaptability—does not accommodate to the different needs of family members○ Noise—radiating throughout the home○ Storage—efficient storage for the multitude of activities within the spaced	<p>4. Kitchen/Dining (communal component)</p> <ul style="list-style-type: none">• <u>Activities</u><ul style="list-style-type: none">○ Cooking○ Dining○ Gatherings• <u>Issues</u><ul style="list-style-type: none">○ No adaptability—cooking-eating-gathering○ Accessibility○ Lack of storage—visibility of mess○ Sufficient space for intimate to communal gatherings	<p>5. Entrance (communal component)</p> <ul style="list-style-type: none">• <u>Activity</u><ul style="list-style-type: none">○ Entrance/exit○ Initial greeting space• <u>Issues</u><ul style="list-style-type: none">○ No privacy○ No defined identity○ Provide transitional space <p>6. Outdoor (communal component)</p> <ul style="list-style-type: none">• <u>Activity</u><ul style="list-style-type: none">○ Gathering space• <u>Issues</u><ul style="list-style-type: none">○ Lack of outdoor space

Analyzing the findings in the table, it becomes clear that in order to design an efficient multigenerational home, one must consider dynamic entities that will adapt to the various lifestyle and needs, with an eye especially to changing family patterns. The home needs to be reinterpreted as a cohesive, flexible space that provides the family with identity and adaptability. The question becomes, then: how do architects design a flexible and dynamic living arrangement for multigenerational families? We are dynamic beings who should design dwellings that enforce this perception.

Reflection

Flexible housing is ultimately a concept that responds to the unpredictability of several influential factors. These factors that affect the inhabitable space are both external and internal. Due to the unstable economy, a decrease in the number of traditional family units, a continuing increase in older people, an increase in the number of single-person households, and an increased demand for shared accommodation,⁸⁶ housing that adapts to a variety of changes is necessary. The majority of housing developments across the world and in the United States are currently designed to fit a stereotype of the vanishing nuclear family; they are dwellings inflexible to change. It is apparent that new solutions are needed the design of present and future dwellings.

⁸⁶ Schneider, 37.

CHAPTER 6. DESIGN PRINCIPLES AND PRECEDENTS

The projects analyzed in this section represent inspirational designs to generate concepts for extended family living. Presented in two sections, section one examines three design principles. It is organized into themes: flexibility/adaptability, identity, and new urban dwelling. Each theme has specific values to transform the perceived permanence of current domestic environments into responsive spaces that reinforce our new, erratic lifestyles. The three categories explore new ideas on dwelling design, address issues of the stereotypical nuclear dwelling, and reevaluate how families and extended families exist within their habitual space.

The second section of the chapter investigates two precedent studies. The precedent studies embody innovation, flexibility, and a new concept for living. Precedent analysis will formulate guiding architectural principles to be utilized in the final design product—a multigenerational high-rise apartment unit that is not a static form, but rather a dynamic gathering place that celebrates the generational lifestyle.

Flexibility/Adaptability

For the purpose of this doctoral research, flexibility and adaptability are interchangeable words that relate to the definition of providing occupants with forms and means that facilitate a fit between their space needs and the constraints of their physical quarters either before or after occupancy.⁸⁷ A successful flexible/adaptable house requires minimal intervention to accommodate change. This is the primary focus of the

⁸⁷ Friedman, 1.

multigenerational high-rise unit: living spaces that consider future growth and the evolution of the family lifecycle.

Flexible architecture consists of buildings that are designed to respond easily to change throughout their existence. The benefits of this form of design can be considerable: it remains in use longer, fits its purposes better, accommodates users' experience and intervention, takes advantage of technical innovation more readily, and is economically and ecologically more viable.⁸⁸ Adaptability and flexibility in design offers the individual or families the option to accommodate various life cycles that occur throughout time; individuals move in and out, family conditions change, and the need for specific functional spaces is transformed over time. Homes can be designed to address these changes so that, for instance, a portion of the space can be segmented to become an independent dwelling unit for rental and for supplemental income purposes.⁸⁹

Pile Up, Rheinfelden, Switzerland



Figure 11. Pile Up, Rheinfelden, Switzerland

Source: New York Times
Construction Completion: July 2006

⁸⁸ Robert Kronenburg, *Flexible: Architecture that Responds to Change*, (United Kingdom: Laurence King Publishing Ltd, 2007), 7.

⁸⁹ Friedman, 9.

Located in the historic town of Rheinfelden, Switzerland, the Pile Up complex is comprised of 22 residential units and 2 studio units. Designed by Swiss architect Hans Zwimpfer, the Pile Up apartment complex represents innovative design solutions to the single-family dwelling. Zwimpfer devised a concept that utilized the “L” shape floor plan to create the perception of more interior space. In order to provide a single-family dwelling’s sense of spaciousness and natural light, each apartment has a section that is two stories high, in the vertical leg of the L. Open-air terraces are also in this lofted area, so that residents don’t feel cramped in their outdoor space.⁹⁰ The apartment also employs the idea of flexibility within the interior. The use of only exterior load-bearing walls permits the interior to be open and adaptable to the inhabitants. Designing for flexibility, the floor plan maximizes the spatial quality of the area.

The Pile Up System, under patent by architect Hans Zwimpfer, utilizes an interlocking structural form that responds to urban sprawl and urban living. The stacking of the staggered rotated “L” units creates a dense form. It is a concept that the architect describes as single-family homes stacked on top of each other to create an adaptable urban living environment for families and individuals.⁹¹

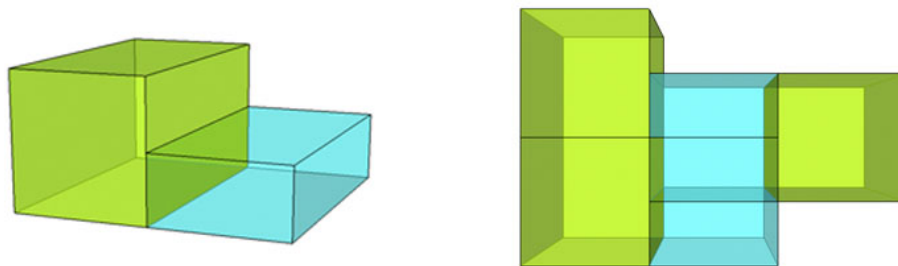


Figure 12. Pile Up Concept

Image represents the stacking of modular units to create dense apartment units

⁹⁰ McGrane, 1.

⁹¹ Ibid., 1.

The diagrams in Figure 11 represent the Pile Up concept. Each apartment unit comprises a single-story section (indicated in blue), which functions as the private realm for the owners, and a two-story section (indicated in green), which forms the public area. The image on the left represents a single unit. The image on the right represents the modular stacking of units to create a dense living complex.

The design use of modularity and its open floor plan drives the Pile Up project. It epitomizes the idea of flexibility in an urban context. The open floor design provides the inhabitant with flexible interior spaces. Interior spaces in the floor plan function as neutral living rooms that accommodate a wide range of uses. With its capacity for several living situations and alterations of interior programs, the open floor plan concept appears to be an efficient way for future adaptation. Designated in the floor plan of the apartment unit (see Figure 13), both private and public zones are articulated. Fixed spaces such as the bath, kitchen, and private sleeping quarters are enclosed and considered inflexible spaces, while the adjacent public zones are open to create multi-functional areas for user adaption.

The concept of stacking modular forms in a Tetris-like format to create a dense living environment is a principle that will be considered in the design of the multigenerational unit. Based on a modular structural system, spaces within the unit can be added or subtracted accordingly to the users need. The modular form provides an efficient system for densely structuring the apartment complex, while maintaining the open atmosphere by the staggering of one story and two-story sections. Devising an efficient structural and design system that will accommodate to change is a priority. Creating a system that will adapt to future changes and accommodate the family throughout their existence in the home is ultimately the idea for sustaining multigenerational living.

Housing Development in Wiesbaden, Germany



Figure 13. Housing Development in Wiesbaden, Germany

Source: Schittich, Christian. Housing for People of All Ages.
Construction Completion: 2000

Designed by Dietz Joppien Architects, this urban complex located in Wiesbaden, Germany, demonstrates highly flexible yet economical layouts with efficient usage of space.⁹² The project consists of 400 units in a four building, five-story high apartment complex. The development houses residents of all ages and utilizes the first floor for families with disabilities.

The floor plans are notable for their flexibility. Neutral spaces, which can be interconnected or divided by ceiling-high sliding walls, allow numerous floor plan alternatives. It is possible for the living spaces to be oriented to the street frontage, the courtyard side, or both--thus providing an open volume from façade to façade.⁹³

The floor plan design explores the evolution of family structure and the adaption to life cycle changes. Floor plan A signifies the shifting of generations and redefinition of space. As the child matures and moves out, the rooms are redeveloped to fit the

⁹² Schittich, 134.

⁹³ Ibid., 134.

family's current lifestyle. For example the child's bedroom becomes the master room for a grandparent. The child moves out and the elder moves in. Floor plan B represents spatial flexibility. According to daily routine, movable wall partitions are used to enclose or open the space for privacy or communal gatherings. Floor plan C represents the spatial adaption to various lifestyles. Interconnecting rooms create specific zones for diverse usage and the needs of family members in the household.

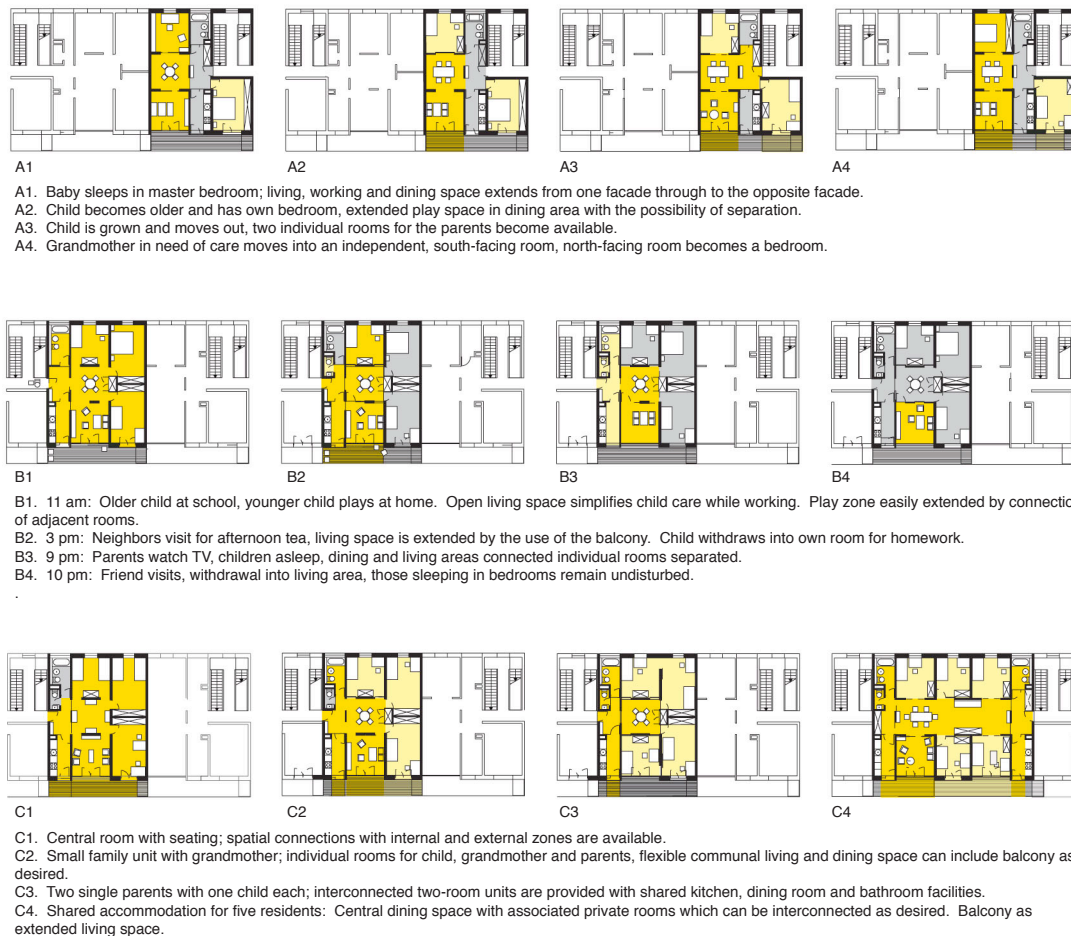


Figure 14. Housing Development Floor plans in Wiesbaden, Germany

Source: Schittich, Christian. Housing for People of All Ages.

In the housing development in Germany, the architects utilized a design solution by creating neutral living spaces—an idea that must be considered in flexible housing. Room labels designate use and with this, an accepted pattern of occupation in which standard social patterns, often based on outmoded conventions, are spatially inscribed in the layout of the dwelling. Instead of formally arranging rooms according to a pre-set system of classification, a non-hierarchical and loose-fit system allows for much greater openness in how rooms will be interpreted.⁹⁴

Dietz Joppien Architects utilized a concept of creating equal sized “rooms” that do not define a function, but instead allows for space adaptability dependent on the users need. The neutral rooms are designed around a central communal core. This core establishes a central gathering location within the home for the family. The rooms surrounding the living core are flexible to accommodate the functional and social changes that occur within the family. However, this very fluid solution not only takes into consideration movable partitions to create new/adaptable spaces, but also facilitates spaces that are productive and interactive for the inhabiting family.

Identity

Buildings that express and adapt to qualities of a specific location, culture, surrounding, and its inhabitants are highly, responsively built environments. Structures that reflect these characteristics not only function as a receptive space, but as an entity that embraces a dynamic concept of building and occupant integration. In the case of housing developments, a harmonious environment is established by creating a dwelling space that embraces the identity of the inhabitant. When there is a lack of adaptable

⁹⁴ Schneider, 147.

housing, it is necessary to design homes that reflect a dynamic identity. The static, standard home does not accommodate various lifestyles; and, its inhabitants are not encouraged to reevaluate their own living standards. It is the understanding of space, activity, and personal relationships that advances the creation of a functional, adaptable identity for the residing family and future inhabitants.

Since multigenerational families have three or more generations residing under a single roof with varying lifestyles and generational differences, the creation of a healthy environment is a challenge. A multigenerational household must consider and accommodate the ever-changing life cycle of its members. A dwelling that engages, transforms, adapts, and celebrates the occupant's identity will define a livable space for the extended family.

Drawer House, Tokyo, Japan



Figure 15. Drawer House, Tokyo, Japan

Source: Lam and Thomas. [Convertible Houses](#).
Construction Completion: 2002

Located in Tokyo, Japan, this 1700 square foot home utilizes the open floor plan concept in an innovative way. With limited building space, the architect wanted to

optimize the living area because he believes the living room should be used for everything, embracing the concept of a multifunctional space for the family. The design solution is implemented by sets of functional drawers condensed to one side of the wall, then extracted and retracted into the main living space. Functional drawers are pulled into the neutral living area to create and to reveal sleeping areas, storage, kitchen, and baths. The philosophy of the Nendo drawer house is the creation of conversations and relationships between objects and people.⁹⁵

The concept of individual program units pulled in and out from the sidewalls into the neutral place in order to create the functional area is a dynamic living space experience. This idea eliminates the fixed relation of program, space, and room in a dwelling. The drawer house creates individualized identities that are determined by the user. Rooms do not dictate the program, users do. Habitat programs such as beds, storage, and dining elements are brought out for use and retracted when not needed. This concept eliminates the idea of confined and static programs/spaces in the home and enables the occupants to reflect their true nature in daily activities and various lifestyle patterns. A bedroom is not always in use; it can be either put away as reflected in the Drawer House, or it can become a multifunctional space. This is an idea that will be transferred into the prototypical multigenerational unit-- a design with no preconceived plan, one that is flexible wherein the users create their own living space.

New Urban Dwelling

While housing developments become further detached from the vision of community, the current urban landscape is progressing into a complex pattern of social

⁹⁵ Lam, 49.

and economic uses. The term urban sprawl identifies developments that extend further and further from the core business district, which in turn leads to greater dependence on automobiles.⁹⁶ Urban sprawl affects the integrity of design developments that are cohesive in usage and preserve a healthy lifestyle. From extensive pollution to health problems, urban sprawl disconnects the public from the surrounding context.

Smart growth invests time, attention, and resources in restoring community and vitality to center cities and older suburbs; it also encourages more town-centered and transit and pedestrian-oriented development.⁹⁷ The approach in this concept is to build infilled and compact neighborhood developments, thereby improving community living, preserving open space, eliminating congestion, and enhancing livability. This principle is vital to the improvement of cities and communities to reverse the negative impact of urban sprawl.

Developing higher density neighborhoods promotes fewer vehicles and more pedestrian friendly paths throughout the community. Doubling density in a metropolitan region produces a 20 to 50% reduction in vehicle miles traveled annually.⁹⁸ This substantial reduction promotes neighborhoods that appeal to people who walk, as well as a stronger community connection throughout the development. Social interaction is expected to increase due to the dense, mixed population and the increase in group activity.

⁹⁶ Daniel F Williams, Sustainable Design: Ecology, Architecture, and Planning, (New Jersey, 2007), 24.

⁹⁷ Morgan Stanley Dean Witter, Smart Growth: Economy, Community, and Environment, (Washington, DC: ULI, 1998), 4.

⁹⁸ US Green building Council, 113.

NEXT21, Osaka, Japan

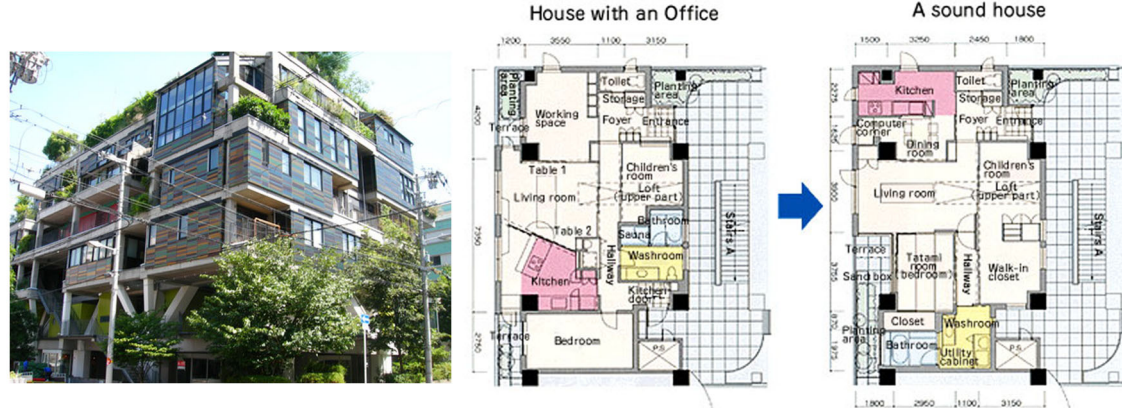


Figure 16. Next21, Osaka, Japan

Source: Kronenburg, Robert. *Flexible: Architecture that Responds to Change*.
Construction Completion: 1993

NEXT21 is experimental urban multi-family housing built in Osaka, Japan. Developed by the Osaka Gas Company, the leading Energy Company in the Osaka precinct, this residential complex was designed to accept radical changes in servicing and dwelling layouts with minimal disruption; it was built as a test-bed for innovative design.⁹⁹ NEXT21 is a case study that represents a unique urban complex, utilizing innovative, sustainable design strategies and a structural system that promotes flexibility in the units.

Completed in 1993, the six-story, eighteen-unit apartment complex was conceived to accommodate the modern lifestyle of Japanese families. Four of the eighteen units were designed in cooperation with the residents. The remaining apartments consist of different, enhanced living environments proposed by the design team.¹⁰⁰ Residing in the complex were families of the Osaka Gas Company. The

⁹⁹ Kronenburg, 53.

¹⁰⁰ Ibid, 53.

families lived in the experimental apartment for five years in order to compile data of their experience.

The unique building system was developed as a two-stage process. The structure was the first stage and consisted of a fixed grid system that allowed for prefabricated wall panels to be in-filled in a flexible manner. The interior spaces were the second stage that permitted individual families to create an adaptable living environment that suited their personal needs.

The diversity in the units of NEXT21 is an epitome of its ability to adapt to various lifestyle, family composition and occupancy patterns expected to occur during the course of its occupancy after construction. Each unit was independently designed—within a building frame that consists of reinforced concrete columns, beams, and slabs. Walls are excluded from the building frame, which provide the architects with flexibility in locating the exterior walls and organizing the layout of each unit. There have been many collective housing projects where the interior of the units was freely designed. However, few projects have permitted the exterior walls to be freely located as in NEXT21.¹⁰¹

Overall NEXT21 is a design project that employs compact design strategies to minimize deficiencies. The buildings components are standardized to create flexibility in design. NEXT21 truly is a new form of urban living that responds to its users and surrounding context.

¹⁰¹ Kim, 17.

Precedent

Skyvillage in Rodovre, Denmark

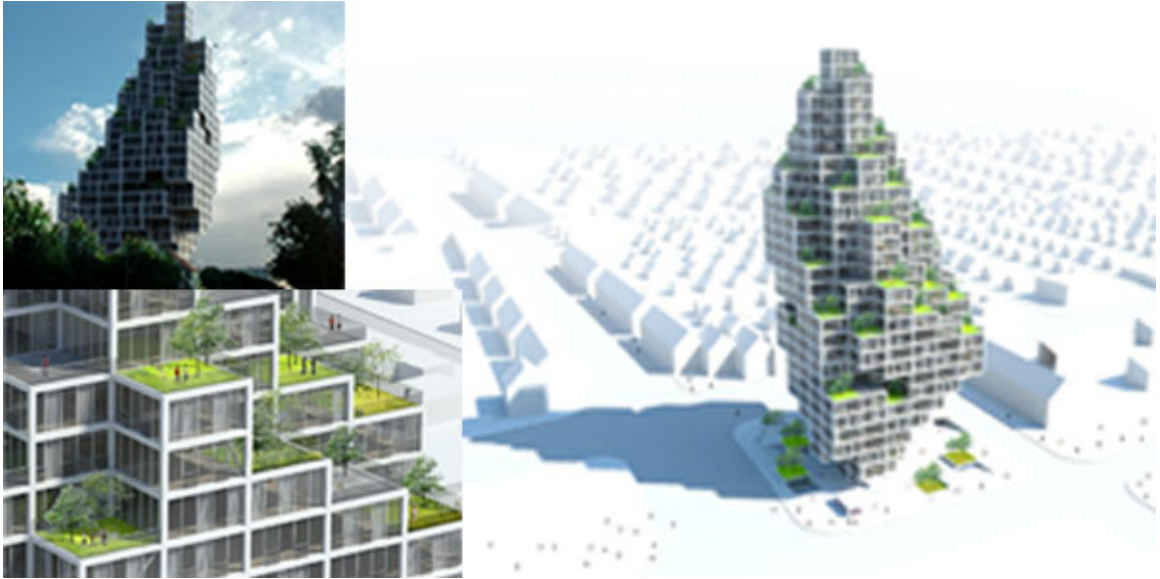


Figure 17. Skyvillage, Rodovre, Denmark

Source: www.mvrdv.nl

Construction Completion: In design process

Innovative in form and function, the Skyvillage in Rodovre, Denmark, is a mixed-use design concept that was collaboratively devised by international architectural firms MVRDV and ADEPT. MVRDV based in Rotterdam, Netherlands and ADEPT based in Copenhagen, Denmark are two pioneering companies that concentrate on delivering captivating and receptive architecture. Joined by their common design philosophy of researching context to build contemporary form, the synergy between these two firms produced a new urban dwelling that responded to current social and economic status.

The winning design for a new high-rise structure competition in Denmark, the Skyvillage is individualized, stackable units that are organized on a grid framework to maximize space and ease construction. Located between Copenhagen and the eastern countryside, the cubic form structure is programmed to provide residences with various

services. Delivering a mixed-use program—housing, retail, open spaces, and hotel—Skyvillage will concentrate on the development of office space. According to MVRDV, the reason for focusing the building program to accommodate more office units is that the Danish economy is unstable and the housing market has slowed. The project takes into account the country's economic turbulence and focuses on flexibility as its primary design concept. Offices can easily be transformed into housing and vice versa to respond to change.

Flexibility in program, structure, and spatial arrangement are ideas that drive the Skyvillage development. With a total building area of 387,500 sq. ft., this proposed 400 ft. tall high-rise complex creates an adaptable vertical village. Based on an approximate 25' X 25' flexible structural grid, the grid-size combines good parking grid, a proper housing unit and office type that can easily accommodate a large variety of tenants. The units can also be joined together to form larger spaces to accommodate larger apartments, hotel rooms, or office suites.¹⁰² The units are further organized around a three-tier central core that allows for independent access to the various functions in the complex. On each floor a corridor band surrounds the structural core and allows an open entry.

The floor plan is designed as a two unit bay system that creates varying spatial depths. This leads to more facades, which leads to more light and views. By employing this method in a different way on every floor, a specific composition of terraces and balconies can be made. The process entails pulling away units of the cube and repositioning them on top.¹⁰³ As a result, multiple arrangements can be satisfied.

¹⁰² Rodovre Skyvillage. MVRDV. 12 Jan. 2009. <www.mvrdv.nl>, 1.

¹⁰³ Ibid., 2.

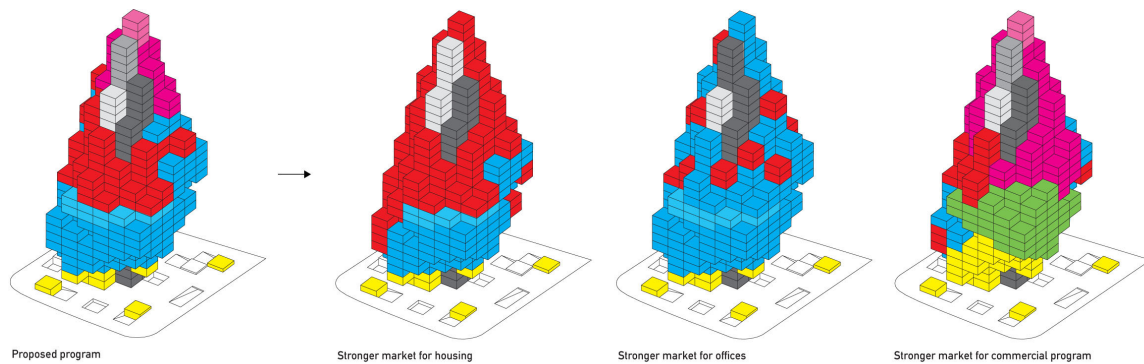


Figure 18. Skyvillage Program Flexibility

Source: www.mvrdv.nl

The program throughout the structure also takes into account flexibility. Retail space and restaurants take up the slim lower floors, offices are situated in the intermediary levels, and residential units are terraced towards the north to give the building a curved profile. These terraces give each residential unit a sky garden with a sunny southern aspect. Finally a hotel sits at the top of the high rise with views towards central Copenhagen.¹⁰⁴ Program spaces are can be further transformed based on market forces and economy (Figure 17). This provides the ultimate flexibility.

The Skyvillage is an innovative mixed-use development. Strongly emanating throughout the design, the concept of flexibility is incorporated in the project. This flexibility in program and unit design allows for adaptation to various internal and external factors: economic, environmental, and/or personal. Change is inevitable; the Skyvillage takes into account this idea and has developed a successful product.

¹⁰⁴ Rodovre Skyvillage. MVRDV, 2.

Skyvillage Summary

As a precedent study to my research in developing a high-rise complex for multigenerational living, flexibility/adaption is a major idea that will be addressed. Flexibility in architecture is necessary in today's society where unavoidable changes are affecting daily activities and lives of people. Architecture must respond to these profound factors and seek solutions to better engage future events.

The Skyvillage project, takes into account program flexibility to address future concerns and needs of the people of Copenhagen, Denmark. The innovative high-rise utilizes an open floor plan to allow for modification. Although the open floor plan principle may not be a unique concept, it responds to various usage and functions. As a result of the open floor plan design, an expressed exterior form is created. A pixilated glass façade that is intentionally designed to relate its surrounding urban context creates an iconic piece. The staggered placement of each cubic form conveys movement and growth. The form takes on a symbolic meaning of vertical living or vertical village that is adaptable in program and its environment. It is this idea that I desire to develop, creating architecture that is not finite, but a habitual environment that responds to change. The concept for creating adaptable and flexible spaces will extend the life cycle of the building and also improve the quality of life for the residences within my proposed complex.

Naked House, Kawagoe, Japan



Figure 19. Shigeru Ban's Naked House, Kawagoe, Japan

Source: Stang and Hawthorne. [The Green House: New Directions in Sustainable Architecture](#). Construction Completion: 2001

The Naked House, designed by innovator and architect Shigeru Ban is a project built for a multigenerational family in Kawagoe, Japan. Revered as a radical dwelling design that encompasses nomadic architectural features, the Naked House re-imagined how the living space is divided in a home.

The design is derived from the aesthetic qualities of greenhouses that surround the site. To compliment the vast agricultural context of the location, Ban wanted to create an unadorned, open floor plan space for living. The interior space is designed in a seamless manner.

Along the edges of the main rectangular space are a few fixed elements, like a kitchen, and a bathroom. In the middle of the structure float four open, rolling boxes, raised on casters and open on two sides, which serve

as bedrooms. The bedrooms can be joined together, their sliding doors removed, to create a larger combined space.¹⁰⁵

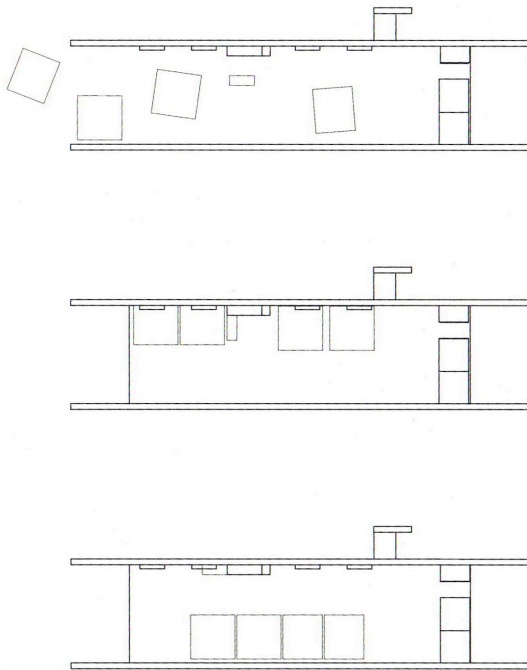


Figure 20. Naked House Floor Plan

Source: Stang and Hawthorne

Naked House is a simple, open, innovative, and flexible housing design that juxtaposes different concepts of space: private versus public and static versus dynamic. The public realm of the house is considered a universal and adaptable space. The users inhabit the public/open floor plan by moving a four-walled private box with casters anywhere in the open floor plan. These boxes divide the space into private and public areas. The engagement of the flexible private boxes and open floor plan evokes the

concept of user identity, no separation of family members, and adaptable spaces for an extended family. The open floor plan also retains a living environment of togetherness that corresponds to the lifestyle of multigenerational families and traditional Japanese families.

Privacy is not considered in an enclosed space with static walls in the Naked House. In a traditional home, rooms are inflexible and often closed off from the rest of the space. The Naked House deconstructs the private spaces of the home by creating an image of a room (open ended box with wheels for movement) with privacy being a

¹⁰⁵ Stang, 89.

visual statement. Privacy does not have to be a fully enclosed area, but a visual boundary that closes off the space.

Static and dynamic are concepts that allow the Naked House to function as a flexible space. Static elements in the home are the fixed utility cores or the plumbing systems. The utility cores are static to provide a fully adaptable living area for the dynamic and flexible boxes.

Ideas to maintain and utilize in the prototype design are concepts of flexibility. In the Naked House, flexible spaces are achieved through the active movement of the private cubes. The cubes or private spaces are either attached or detached according to the family's needs. To accommodate a fluid living environment throughout the home, fixed versus flexible elements need to coexist to accommodate various conditions.

Key Points

The precedents that were presented in this chapter show various ideas that could address solutions for multigenerational living. The houses and apartments in this chapter reveal innovative designs that inspire new ways to live. Key points and successful strategies of each precedent are presented below. These key points serve to ground the doctorate project design.

Pile Up, Switzerland (Hans Zwimpfer)

- Utilizes modular forms to create a dense living environment (tetris-like format)
- Each apartment unit comprise of a single story private area and a two-story public section that forms the household
- Incorporating only load-bearing exterior walls achieve interior flexibility

Housing Development in Wiesbaden, Germany (Dietz Joppien Architects)

- Designed for flexibility/adaptability based on the evolution of the family
- Movable walls accommodate the changes of program and needs

Drawer house, Tokyo, Japan (Nendo)

- Functional drawers condensed to one side of the wall that are extracted and retracted into the main living space
 - Philosophy of the drawer house is to emphasize creating conversations between objects and people
 - The Concept eliminates the idea of confined and static programs/spaces in the home to reflect the true nature of humans are their daily activities and various lifestyle patterns—bedrooms are not always used so it can be either put away

NEXT 21, Osaka, Japan (Osaka Gas Company)

- The unique building system was developed as a two-stage process
 - The structure was the first stage and consisted of a fixed grid system that allowed for prefabricated wall panels to be infilled in a flexible manner
 - The interior spaces were the second stage that permitted individual families to create an adaptable living environment that suits their personal needs

Skyvillage, Denmark (MVRDV)

- Designed on a 25' X 25' flexible structural grid
 - A proper housing unit and office type that can easily accommodate a large variety of tenants
 - Program spaces that can be transformed based on market forces and economy

Naked House, Japan (Shigeru Ban)

- The Naked House re-imaged how the living space is divided in a home
- Fixed vs. flexible
 - Bed spaces are modular in design with caster for flexibility
 - Bedrooms can be joined together, their sliding doors removed, to create a larger combined space
 - These boxes divide the space into private and public areas. The engagement of the flexible private boxes and open floor plan evokes the concept of user identity, no separation of family members, and adaptable spaces for an extended family.

CHAPTER 7. DESIGN: THE MULTIGENERATIONAL UNIT

Overview

The single-family dwelling is a universal symbol of status, shelter, and livable space for the nuclear family. However in present day society, changing demographics, lifecycles, life expectancy, and varying lifestyles are affecting how we live and reside within our personal refuge. With drastic economic and social changes occurring today, the traditional family is transforming into a set of generations that reside in a single house. The single-family home is no longer an adaptable, built environment that will sustain a quality of life suitable for the modern extended family.

Multigenerational living or integrated living as referenced by author Christian Schittich's *In Detail: Housing for People of All Ages: Flexible, Unrestricted, Senior-friendly*, involves housing developments in which different residents live together, usually in large residential complexes. The object is to improve neighborly support between different generations (multigenerational living) and groups of residents with different needs.¹⁰⁶ The exchange of mutual support will provide a healthier living environment for all. Concentrating on the various needs and groups of people--single families, multi-families, seniors, disabled, and immigrants--exposes the complexity of society and the necessity for integrated residential developments. Therefore, integrated living is perceived as a new architectural model of the twenty-first century family.

Integrated living is an idea that accentuates various styles of living and needs and one that depends on location, formulated objectives, and those social parameters of

¹⁰⁶ Schittich, 11.

the future users that are already known.¹⁰⁷ Integrative living in its final consequence entails reflecting on the complexity of our society, being on the lookout for new tendencies, and offering suitable structural solutions in housing. Integrative living is not a minority program but rather requires penetration from the macro-level into the micro-organics of our society.¹⁰⁸

The home is a self-containing space that suppresses the nature of the family—a communal unit. A conflict exists between the dynamic nature of people's lives and the places in which they choose to reside. As household members grow older, their habits, lifestyles, and use of space change. Yet residents often tend to regard the physical environment in which these changes occur—the home—as unchangeable.¹⁰⁹ Families would rather change their own habits or move rather than undertake renovations to their homes to make them more adaptable. The apartment unit will challenge the way families perceive a home by addressing the need for flexibility and responsive designs that adapt to change.

Place—An Ideal Site

Due to the project's prototypical concept, the location of the project was generally analyzed. The following section, describes the ideal site for the multigenerational housing complex. Preferably, the project will be developed in compliance with the Ward Neighborhood Master Plan.

Strategically located between Waikiki and downtown Honolulu, the Kaka'ako district provides an unprecedented opportunity to create an integrated, livable urban

¹⁰⁷ Schittich, 12.

¹⁰⁸ Ibid., 12.

¹⁰⁹ Avi Friedman, The Adaptable House: Designing Homes for Change, (New York: McGraw-Hill, 2002), ix.

environment, enabling people to live, shop, socialize, dine, and be entertained conveniently outside their front door, rather than at a distant location for which they must utilize an automobile.¹¹⁰

‘Oahu

Known as the gathering place, ‘Oahu is the third largest island of the nine that comprise the Hawaiian Island chain. Occupying a mass of 593 square miles, this Pacific island accommodates a current population of 900,000. As the commercial and business hub of the Hawaiian Islands, ‘Oahu has been the center for growth since 1990. ‘Oahu is expected to continue to develop at a steady rate.

Compiled of several districts and subdivisions, Honolulu, is the urban core on the island of ‘Oahu. As the capital of the state, this southern shore district has an approximate population of 370,000. Indicated in the above image, Honolulu is a dense metropolitan area that thrives on the tourist, governmental, industrial, and commercial industries.

The climate for Hawaii includes consistent temperatures all year round: moderate humidity, strong trade winds, and average rainfall. Hawaii enjoys basically two seasons: summer (May to October) and winter (October to April). In summer, temperatures during the day are in the upper 80’s, dipping to the low 70’s to upper 60’s at night. In the winter, temperatures keep to the low 80’s, reaching the mid to low 60’s at night.

¹¹⁰ Hawaii Community Development Authority, Ward Neighborhood Master Plan, (Honolulu: General Growth Properties, Inc., 2008), 19.

Ward-Kaka'ako

Located in Honolulu on the island of Oahu, the Ward district thrives as a retail and commercial mixed-use center. Composed of individual own companies to large businesses, and nationally chain retailers, the Ward neighborhood supports an active existence that will complement the Ward Neighborhood Master Plan for a new type of urban village. The Hawaii Community Development Authority is encouraged about future prospects for development:

Hawaii's multicultural diversity will be celebrated in Ward Neighborhood. Here will be a place to raise a family or to grow an international business. Residents and visitors—people of all ages and incomes—will be part of an exciting community that captures the entrepreneurial spirit of *Kaka'ako* and transforms it into a place that will be different from any other urban destination worldwide.¹¹¹

In traditional Hawaii, the *Kaka'ako* district, swampland was a place for fishing and other recreational practices by Hawaiians. During the reign of King Kamehameha I, Kaka'ako was a flourishing area that produced salt. As commercial and residential uses started to replace Kaka'ako fish and salt ponds, the mud flats and marshes were filled. In the 1880s, the shoreline was extended by huge public works projects that reclaimed land from low-lying coastal areas.¹¹²

Prior to the rezoning in 1950 as an industrial center for Oahu, Kaka'ako was a diverse working class community with homes above shops. After a change in zoning practice, Kaka'ako became a hodgepodge of industrial, commercial, and residential districts. Disengaged from its surroundings and uses, the Kaka'ako neighborhood is

¹¹¹ Hawaii Community Development Authority, 5.

¹¹² Ibid., 11.

implementing a 20-year master plan that will rejuvenate the area and Honolulu. The master plan will enrich the community and focus on residential usage, implementing a new urban development of housing and mixed-uses.

The Ward-Kaka‘ako district represents a vibrant community that will reinforce diverse lifestyles. Its present master plan embraces smart growth, a mixed-use development, and a viable living environment; the site is an accommodating location for the multigenerational high-rise development.

Proposed Site and Land Use

As indicated in the current land use plan provided by the HCDA Master Area Plan, the Ward Neighborhood property is zoned as a mixed-use zone-residential (MUZ-R) and mixed-use zone (MUZ). This type of land zoning allows for the development of residential and commercial use projects. However, commercial use is limited to comply with the master plan for a residential emphasized living core.

The Ward-Kaka‘ako master plan envisions the area as a gathering place for residents and visitors. With the location and nature of the Ward Neighborhood, the district provides numerous of opportunities for diverse living environments. The master plan propose opportunities for (information provided by HCDA Master Area Plan):

- Develop the site with a diverse mix of uses, where people can live, work, visit, learn, and be entertained.
- Provide significant open spaces—plazas, parks and community gathering spaces—by increasing density on some areas of the site and lowering it on others.

- Provide a significant amount of residential development to ensure the creation of sustainable, livable neighborhoods.
- Create new homes and growth opportunities for existing Ward businesses as well as additional businesses moving into the area.
- Respect and reinforce visual linkages between the mountains and the sea.
- Redevelop Auahi Street as a pedestrian-oriented, green urban promenade and principal shopping spine.
- Embrace planned future high-capacity transit.
- Enhance connectivity to the adjacent street system, public parks, and surrounding communities



Figure 21. Proposed Project Site Location and Land Use

Source: HCDA Master Area Plan



Figure 22. Ward Neighborhood Master Plan Renderings

Source: HCDA Master Area Plan

The Master Plan for the Ward-Kaka‘ako development follows the guidelines presented of the Mauka Area Plan. Devised by the Hawaii Community Development Authority—a state agency that focuses on redevelopment and revitalizing urban areas—the Ward Neighborhood Master Plan is proposing a broad mix of new planned uses including:

- 4,300 housing units (approximately 22% of the total housing units envisioned in the HCDA Mauka Area Plan)
- Nearly 14.4 acres of open space and public facilities
- Retail, restaurants and entertainment amenities
- Office, commercial, and industrial spaces
- Transit oriented community

These guidelines will not only create a dynamic gathering environment for visitors and local residences, but a living area of the future. The master plan promotes an urban development that will transcend other communities across the island. Ward-Kaka‘ako neighborhood will celebrate the multicultural element of Hawaii, by developing a mixed-use atmosphere to retain certain demographics.

For decades, Ward has been a favorite gathering place for friends socializing, business interactions, family celebrations and community events. Ward Neighborhood would build on this tradition, creating a vibrant place to live, work and play that can be a magnet for people of all ages and backgrounds.¹¹³

Design Statement

Through the research and analysis conducted, it has been formulated that the family occupies and needs two zones to thrive within a dwelling environment: private and shared spaces. The goal is to create within these zones, dwelling elements that accommodate the changing patterns of multigenerational families. Designing a home that interacts and addresses the evolution of the family provides an inhabitable space for all and the capability to adapt to changing circumstances. The concept of a dwelling that anticipates change is an approach that deconstructs the idea and function of a static house. Instead of a home influencing its users, we see a dynamic structure that harmonizes the complexity of its user. In short, the multigenerational family will be celebrated.

Theoretically, the heart of the modern family is the living space, kitchen, and bathroom. These elements relating to plumbing are immovable, thus proposing and creating the core of the household. Maintaining the idea of the living, kitchen, and bathroom as a core, provides separation and distinction for permanent and flexible spaces. The distinction is an important component in the design because it provides for

¹¹³ Hawaii Community Development Authority, 5.

a fluid spatial order. Although the wet core is immovable, adaptability is a necessary concept.

The Doctorate project focuses on understanding the multigenerational home and lifestyle to develop a living environment that is suitable to the various needs of the extended family in Hawaii. Research included analyzing the dynamics of the family, addressing the need for multigenerational homes, and precedents that reconstruct the idea of living as adaptable environments. The design section of the research concentrates on the development of a living unit that accommodates the “standard” multigenerational family—parents, children, and grandparents. The design takes form of a prototypical flexible unit that accommodates multigenerational families in Hawaii. The reason for the development of a prototype dwelling unit was to allow for exploration of design alternatives and further develop concepts based on the research completed. The fabricated dwelling unit formulates and inspires new ideas in responsive/flexible architecture.

Design Process

Users

Who are the users in the multigenerational home? What is unique about the multigenerational home compared to a traditional nuclear family is that the extended family consists of three or more generations? To design a living environment suitable for multigenerational living, one must consider the various dynamics of each generation and accommodate the changing needs of the inhabitants.

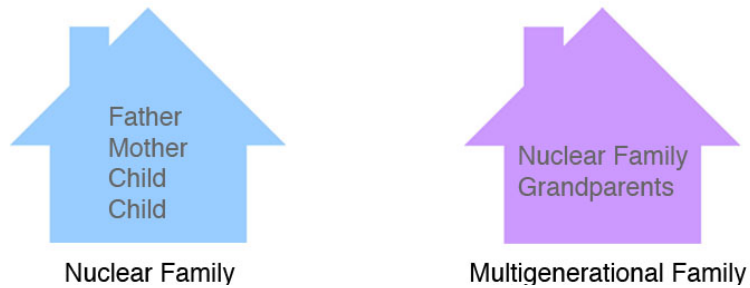


Figure 23. Users in a Multigenerational Household

A multigenerational home consists of three or more generations. These generations all reside under one roof. The prototypical design will explore and provide various living conditions that enforce flexibility/adaptability and multigenerational living. The design will morph to the diversity of the family evolution.

Needs and Issues

The concept of flexibility/adaptability is rarely utilized in residential designs. If the housing design is inflexible, it means that when the users' needs change, the occupants have no choice but to move. This keeps the housing market in a state of permanent flux. If flexibility were built in, occupants would be able to adapt their houses and thus occupy the same space for a longer period. However, housing provisions demand a broader view of the subject than treating housing merely as a short-term investment.¹¹⁴ Housing must accept and meet the demands of changing lifestyles and various life cycles of today. The residence is a significant investment and should provide a living environment able to accommodate the changing needs of its inhabitants. As the family continuously evolves within their personal habitual space, their house should also adapt and evolve to represent each new form of the family. Formulating a design system that recognizes this

¹¹⁴ Schneider, 37.

evolution of the family is essential to a multigenerational family. The diagrams below represent in graphic form, the needs and issues of the multigenerational family.

Needs

- 1 Housing that adapt to the changing needs of individuals**
- 2 Housing that respond to the evolution of the family (expanding and contracting of the family)**

The figure below depicts the evolution of a young couple that grows into a nuclear family and over the course of several years into a multigenerational household. The portrayed family expands and contracts within a standard 3-bed, 2-bath home. The home in which accommodates the homeowners, two children, and their grandparents, represents a multigenerational family residing in a static living space that does not respond to their lifestyle. The vast majority of families that were interviewed in the research conveyed a similar living condition of multiple generations living under a standard 3-bed, 2-bath residence.

Over the past twenty years there has been a decrease in the number of traditional family units, a higher proportion of older people, an increase on the number of single-person households, an increased demand for shared accommodation, and a growing move towards home-working. Statistical data shows that these trends will probably continue into the next decades, but hey will be overlaid with as yet unseen and uncertain demographic developments. Probably the only thing that one can say with any certainty is that housing needs at the end of the twenty-first century will be different from needs and wishes today; the argument for

housing that can adapt to these changing demographics become compelling.¹¹⁵



Figure 24. Evolution of the Family in a Static Household

Evolution of the family: In a static 3-bed/2-bath home (purple: occupied space, blue: multifunctional spaces, orange: adaptable).

1. Young couple resides in a 3-bed/2-bath home. The two additional rooms are multifunctional spaces.
2. Addition of children. Second bedroom becomes child's room. The third bedroom remains multifunctional.
3. Addition of child and adaption to growing child to adult.
4. All adults. Rooms need to adapt to the evolution of child to adult.
5. Addition of grandparents. **The static home does not accommodate the multigenerational family. Bedroom, bath, living, and kitchen/dining areas must adapt to reflect the expansion of the family.**

¹¹⁵ Schneider, 37.

Issues

The issues involved in a multigenerational household are somewhat different from those in a nuclear dwelling environment. With multiple adults, children, and grandparents residing under a single roof, issues ranging from privacy (design issues) to generational differences become relevant to the various individuals. The idea of a house being capable of adaption and relating to the dynamics of the family will start to provide solutions for smarter living environments.

As a result of the conducted interviews of multigenerational families across Honolulu, an understanding of lifestyle and design issues was formed. Table 14 in Chapter 5 (see figure below for reference), examines and identifies the programmatic/spatial issues of extended families living in a static household. To create a housing complex that engages the multigenerational lifestyle, the family living unit must address family dynamics, evolution of the family, and solve issues relating to inflexible dwellings.

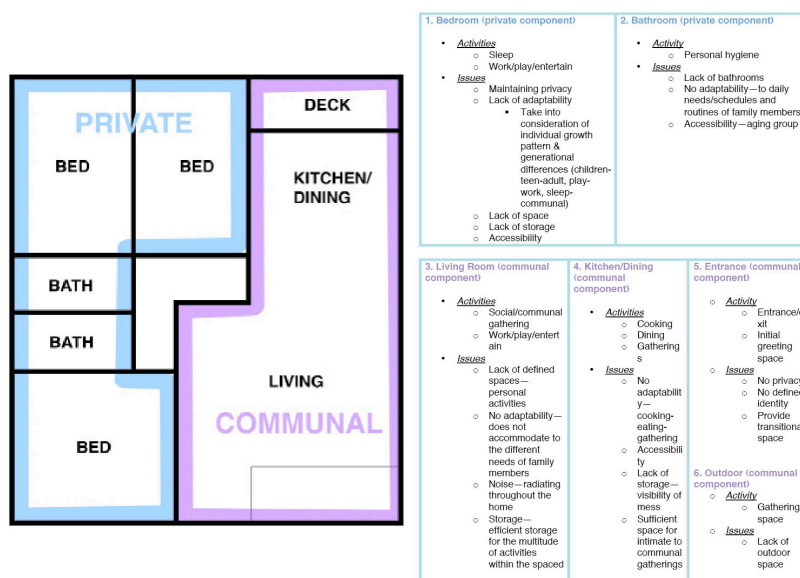


Figure 25. Design Issues

Prototype A and B

Prototype A and B are early design schemes that tests and explore the ideas of flexible/adaptable living environments for multigenerational families. Through the research conducted and analysis of issues regarding family, design, and inflexible dwelling environments, architectural design principles were formed. The principles and ideas formulate the foundation of the project and enable the development of a flexible/adaptable urban apartment for multigenerational living. The design principles are:

- 1 Flexibility/Adaptability**
 - a. Adapting to the evolving family nucleus
 - b. Economies of scale
- 2 Spatial Needs**
 - a. Privacy
 - b. Communal
 - c. Accessibility
- 3 Establishing Identity**
 - a. Establishing an inhabitable space/place that meets the needs and lifestyle of the multigenerational family
 - b. Generational differences, views, and needs

Base Living and Zones

In a traditional nuclear dwelling, living spaces are divided into private and public zones. These zones are sufficient for the nuclear family, but do not acknowledge the growth of the family or the idea of multigenerational living. To accommodate the fluctuation of needs and evolution of the family, a flexible system is incorporated in the base design layout of the housing unit.

The base living is beginning step in the design process that determines the overall and individual spatial dimensions of the living unit. For prototype A and B, the base living incorporates a modular grid system of 25' X 25' for flexibility and efficiency in parking below ground. The primary idea is to utilize a flex-core-flex system to

accommodate the growth of the family into a multigenerational home. Unlike the standard nuclear home that is divided into two distinct static sections, the proposed design incorporates three flexible zones for adaption (see figure 27 for further explanation).

The square footage of the unit is based on providing sufficient space for the multigenerational family. The proposed base living zone of the project is approximately 1875 square feet—three zones (25' X 25' per zone). This is to accommodate the average family member in the multigenerational household.

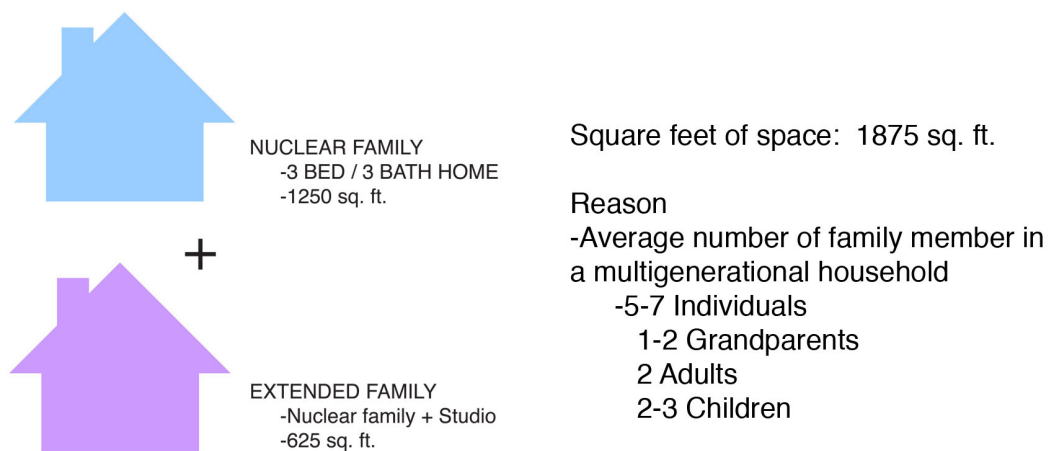


Figure 26. Base Living Proposal

Proposal and reasoning for overall spatial dimension of base living zones. Due to the average number of family members in a multigenerational home, an 1875 square foot dwelling is needed to accommodate the extended family.

Base Living Zones

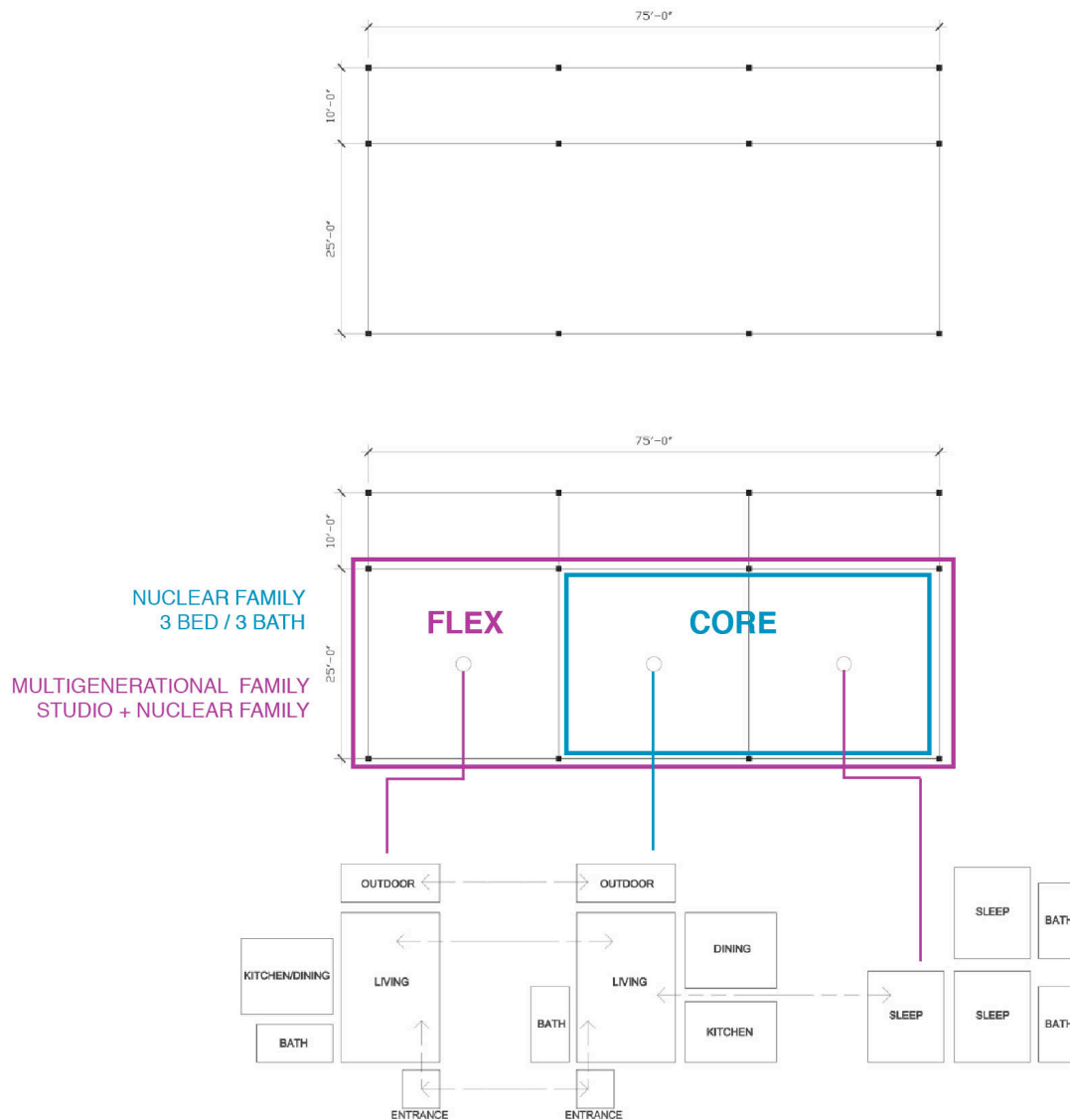


Figure 27. Base Living Zones

Image (top): Overall dimension of living unit to accommodate the extended family.

Image (bottom): **flex-core-flex** system. The overall 25' X 75' living area is divided into three 25' X 25' modules. These modules define living spaces for each generation. The two **flex zones** include private spaces (sleeping areas and bath) for the nuclear family and a separate living unit for the extended (grandparents) family. The **core zone** encompasses the central nucleus (the heart of the family)—communal living space. The flex zones surround the core zone to accommodate the fluctuation and evolution of the family.

-**Flex Zone** = Flexible living private spaces

-**Core Zone** = Static communal living space for the extended family

Prototype A Design

Prototype A utilizes the flex-core-flex base living zone system to accommodate the multigenerational lifestyle. The design of the housing prototype adapts to changing requirements, needs, and evolution of the family. Possible solutions and adaptability of the 1875 square foot unit include separation of living spaces for the nuclear family and grandparents/extended family, transformation of living space to sleeping space, and the use of functional cores and walls to create a flexible floor plan.

The apartment units allows for various layouts. Compact functional utility cores are utilized in the design to divide the space, create multifunctional spaces, and allow for the interconnection and separation of living to private spaces. Functional walls are also utilized to create enclosures and sleep zones. The user pulls the wall within the space to activate the flexible wall system. The functional wall reveals the bed component (similar to the Murphy bed concept) and creates the private zone for the individual—the open zone is transformed into a private identity (sleep quarter or private enclosed space).

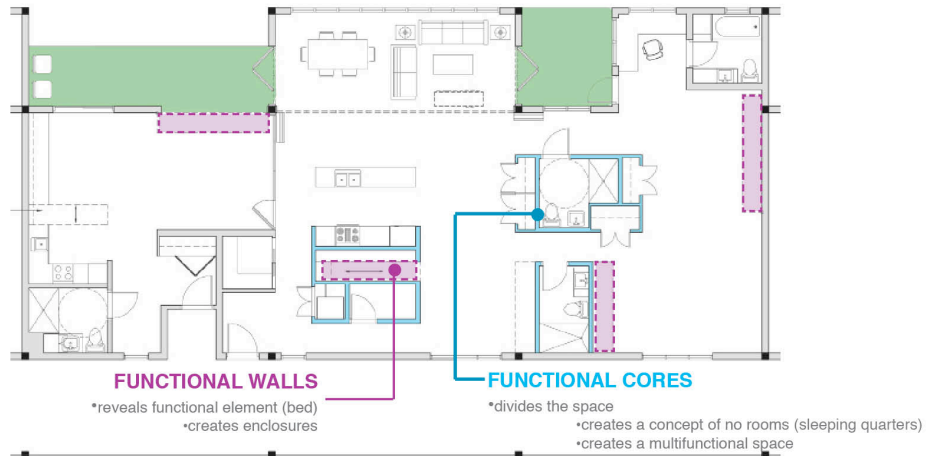
Prototype A Design Facts

- Total square footage of apartment unit: 1875 sq. ft.
- 4-bed/4-bath home
- Separate entrance to nuclear family dwelling and extended family dwelling
 - Separate living space for the nuclear family
 - Separate living space for the grandparents/extended generation
- Flexibility/adaptability
 - Use of functional cores and wall systems
 - Flex-core-flex system

- Flex zone: 1-bed/1-accessible bath for the grandparents
- Core zone: Living communal space, kitchen, dining, and bath
- Flex zone: 3-bed/2-bath private area for the nuclear family
- Flex zones detach to create a nuclear family home and a distinct living space from the main core—creates a rentable studio space (see figure 27)

Prototype A Design—Floor Plans

1 OPEN FLOOR PLAN



DRIVING IDEAS

- *getting away from walls defining function in the home
- *re-imagine the way living spaces are divided in the home
- *design functional cores and walls
- *CELEBRATE multigenerational living--GATHERING SPACES

"Family use common living room for everything...maximize the living area"

2 MULTIGENERATIONAL LIVING CORE

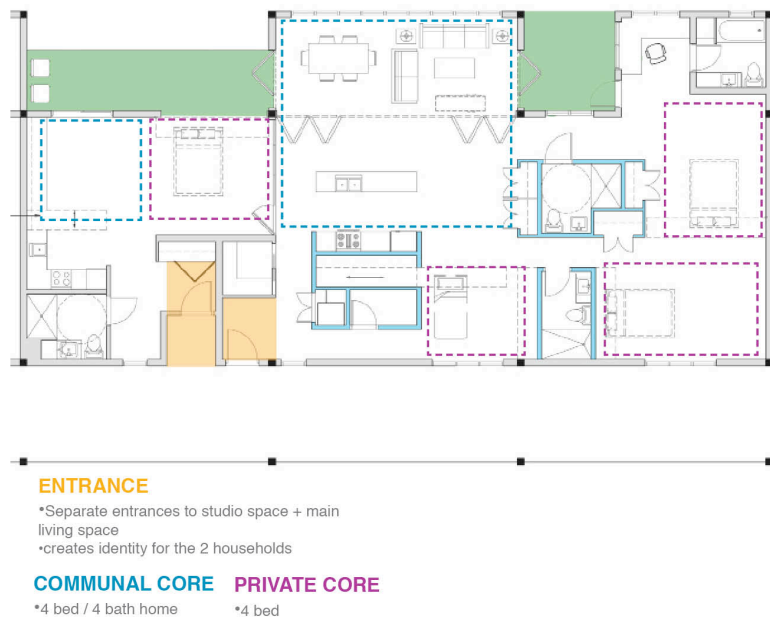


Figure 28. Prototype A Floor Plans

3 FLEXIBILITY

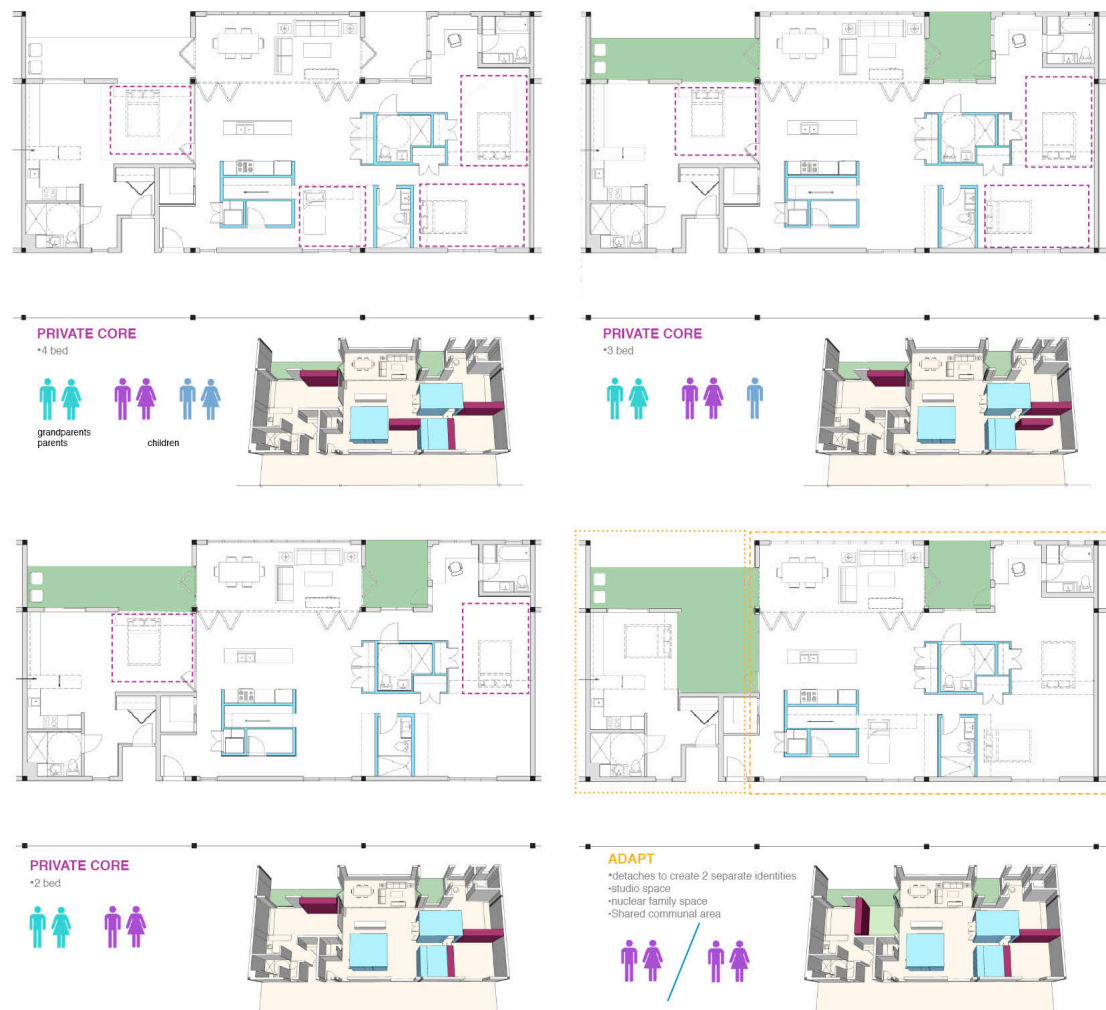


Figure 29. Prototype A Flexibility

Functional walls are pulled in or out of the space to create private zones

Key: Purple dash: Private spaces
Blue Highlight: Utility cores
Green: Deck/outdoor area

Floor plan (clockwise)

Figure 29.1: Multigenerational household (parents, adult children, and grandparents). All three base living zones connected to create an extended living environment. All private spaces are fully activated (4-bed/4-bath/2-kitchen zones)

Figure 29.2: Multigenerational household. One of the adult children moves out. The household becomes a 3-bed/4-bath with larger communal space

Figure 29.3: All children move out. Parents and grandparents live within the household.

Figure 29.4: Adapt. Household detaches to create two separate living identities—studio (bed/bath/kitchen) and nuclear family space (3-bath/3-bath/kitchen).

Prototype B Design

Utilizing the same design process as Prototype A, Prototype B differentiates itself through the incorporation of a linear utility core. Prototype B develops upon the previous concept of functional cores and walls, and the morphing of the unit to reflect the changes of the family. The design of Prototype B focuses on:

- The organization around a linear utility core
- Utility core includes kitchen and bath components
- Utility core area is designed to have a lower ceiling height to differentiate and divide between flex livable area to static utility core of the house
- Consolidating the utilities in an organized core maximize the flexibility/adapting of the living spaces
- Utility cores function as the hear of the family/house
- Functional walls are utilized to create further defined private areas for sleeping within the adaptable living spaces

Prototype B also employs the flex-core-flex base living system to accommodate the multigenerational family. The prototype design further develops the flex-core-flex living system by creating and adapting to a three family/generational family scenario. With the flexible living base (a 25' X 25' living unit module), the apartment unit functions as a multigenerational household, or a nuclear family household with a rentable single unit, or three distinct family units. For further explanation, figure 30 depicts the expansion and contraction of living units in relations to the evolving family nucleus.

Prototype B Design Facts

- Total square footage of apartment unit: 1875 sq. ft.
- 4-bed/4-bath home
- Separate entrance to nuclear family dwelling and extended family dwelling
 - Separate living space for the nuclear family
 - Separate living space for the grandparents/extended generation
- Flexibility/adaptability
 - Use of functional cores and wall systems
 - Flex-core-flex system
 - Flex zone: 1-bed/1-accessible bath for the grandparents
 - Core zone: Living communal space, kitchen, dining, bed, and bath
 - Flex zone: 2-bed/2-bath and work area for the nuclear family
 - Flex zones detach to create a nuclear family home and a distinct living space from the main core—creates a rentable studio space

Prototype B Design—Floor Plans

In figure 30, the base living zone is established on a three family scenario/generations.

- When all three zones are attached, the multigenerational household is created
- The two zones (in blue) create the nuclear family
- Three separated zones (in pink) create three living environments
- The open floor plan and floor plan images represent the adaptability of the private/communal spaces. Functional cores and walls are utilized to create a flexible living environment.
- Two distinct living zones are emphasized in the floor plans. A single living unit for the grandparents (1-bed/ 1-bath/kitchen) and a nuclear family (4 bed/3 bath) home.



Figure 30. Prototype B Floor Plans

Prototype B Design — Flexible Layouts

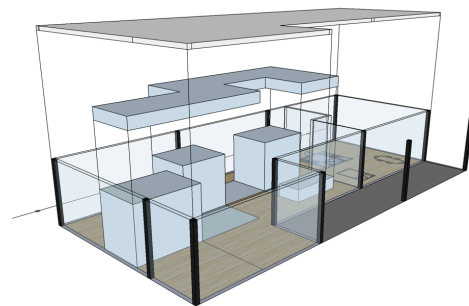
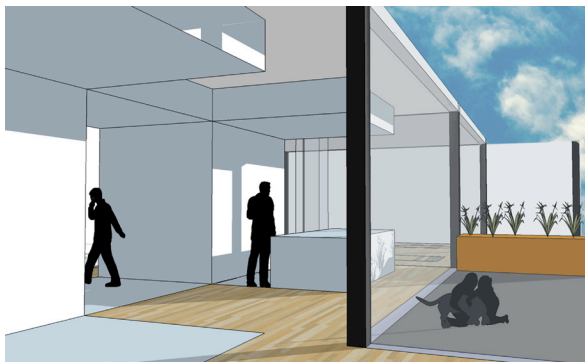
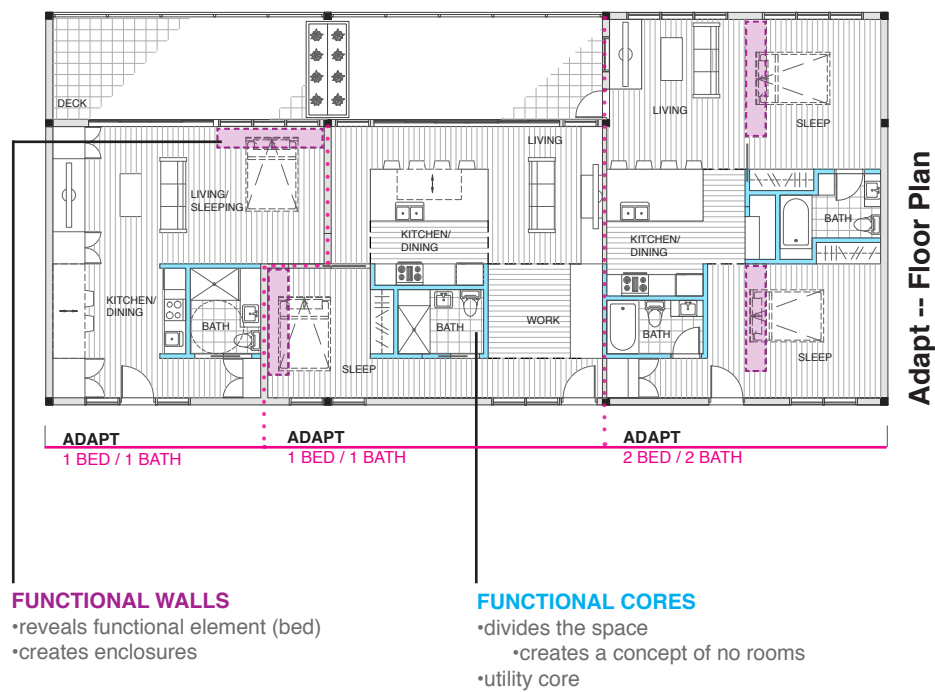


Figure 31. Prototype B Flexibility

The floor plan above represents the three distinct living zones that the household can create:

1. Studio (bed/bath/kitchen)
 2. Studio (bed/bath/kitchen)
 3. 2-bed/2-bath/kitchen
- (Bottom image left): Perspective of interior looking towards the kitchen area
 - (Bottom right image): Axonometric of living utility cores and ceiling layers that differentiate flex and static zones

Prototype A and B Design Issues

Prototype A and B, explores the theme of functional cores and walls to maximize the living space, re-imagine the way living spaces are divided in the home, accommodate family evolution, and define function in the home by disregarding the standard concept of enclosed walls. However, the prototypical designs do not fully adapt to the lifecycle of the family. The apartment unit does not expand or contract based on the fluctuation of the multigenerational family lifecycle. Living and private spaces become static due to the inflexibility and rigid modular form of the utility cores. Functional walls only expose and create private spaces, bedrooms, and enclosures for the individual. The flexible wall system needs to be reexamined to respond to the user and functional purpose of the space—live, sleep, work, and play. The overall design is not an adaptable living environment. The housing unit does not create distinct identities for multigenerational families and their lifestyle.

Prototype C Design

The primary design objective in this design-research is to propose a flexible living environment that meets the needs of the multigenerational family. Due to the rise in life expectancy, cultural/social beliefs, soaring housing costs, economic factors, and other situational reasons, an emerging household of generational living is being considered the modern American family. Analysis of statistical data and conduction of personal interviews of multigenerational families provided a source to explore the critical issues regarding multigenerational living. As the leading state in the nation with families living in a multigenerational household, Hawaii is in need of a new dwelling type to solve current deficiencies of nuclear housing and address living situations that maybe appropriate for the modern family. The final design product or Prototype C evaluates the

research to produce an urban living unit that celebrates multigenerational living and adapts to the nature of their lifestyles—flexible structures that can adapt to the unavoidable changes of the extended family.

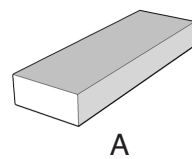
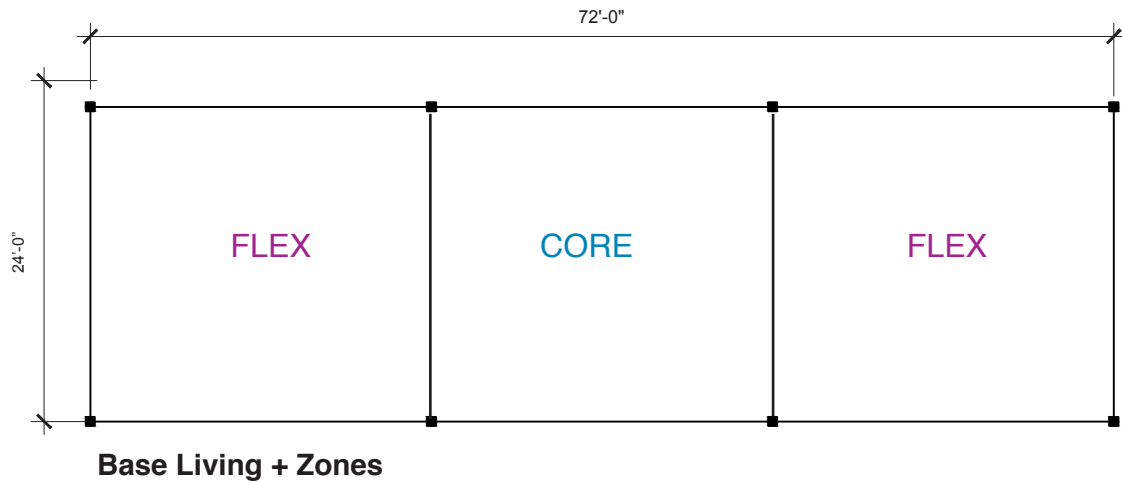
Further developing on the design concepts of Prototype A and B, Prototype C evolved into a thoughtful final design that recognizes design principles and ideas of:

1. **Flexibility/Adaptability**
 - a. Adapting to the evolving family nucleus
 - b. Economies of scale
2. **Spatial Needs**
 - a. Maintaining Privacy
 - b. Provide Communal spaces
 - c. Accessibility
3. **Establishing Identity**
 - a. Establishing an inhabitable space/place that meets the needs and lifestyle of the multigenerational family
 - b. Generational differences, views, and needs
4. **Modularity**
 - a. Modular structural system for efficient design
 - b. Componentization of elements
5. **Multiple Floors**
 - a. Create a dense urban environment
 - b. Provide a two-story high section in the apartment—vertical flexibility
6. **Mix and Match**
 - a. Match the growing and contracting of the family
 - b. Integrated housing complex of family's, generations, and individuals

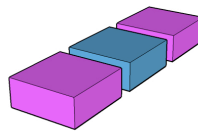
Prototype C Design Facts

- Total square footage of apartment unit: 1728 sq. ft.
- 4-bed/3-bath home
- Base Living Zones
 - Utilizing a 24' X 24' structural grid
 - To adapt to the evolution of the multigenerational family, a 3-unit system (flex-core-flex) is devised—evolves and creates the dwelling based on the lifecycle of the family
 - Evolution 1 & Evolution 2 creates a nuclear dwelling
 - Evolution 1, 2, 3 creates the multigenerational dwelling
 - Within these modules, livable spaces will adapt to the family's needs

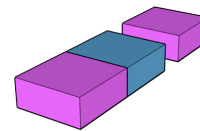
Base Living



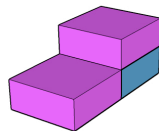
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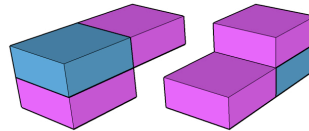
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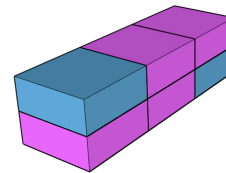
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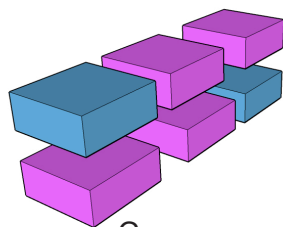
D



E



F



G

Base Living Concept

- a Typical linear approach (as seen in prototype A + B schemes)
- b Prototype C splits the single mass into 3 defined units
- c 2 units combined creates the nuclear family dwelling
- d With the growth of the family and additions of other generations, the dwelling utilizes a second floor to create the multigenerational household
- e The multiple floors and multigenerational units interlock with another to create the urban high-rise
- f Interlocking of units
- g Interlocking of units split into individual units (reverting back to the single unit)

Figure 32. Prototype C Base Living

Base Living Zones

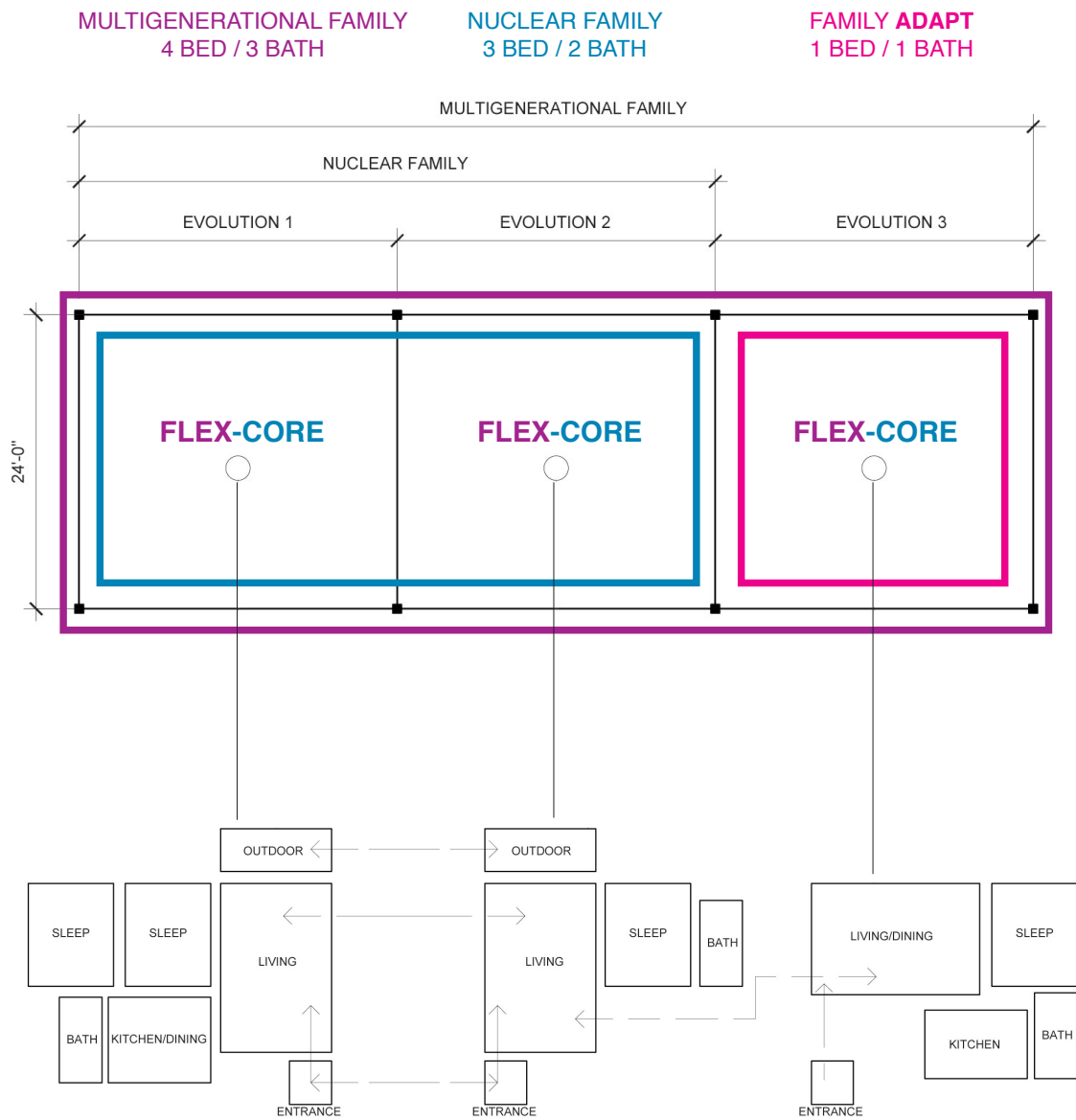


Figure 33. Prototype C Base Living Zones

Design

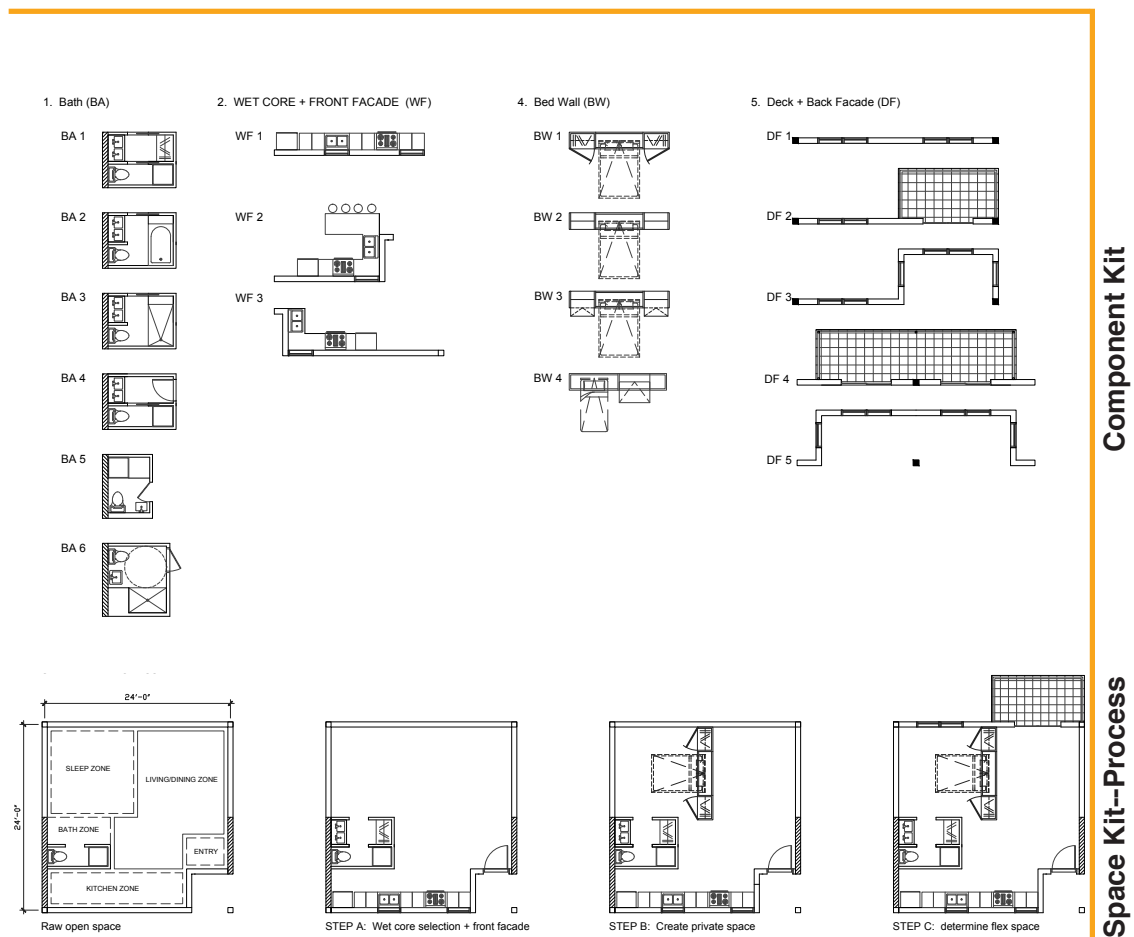
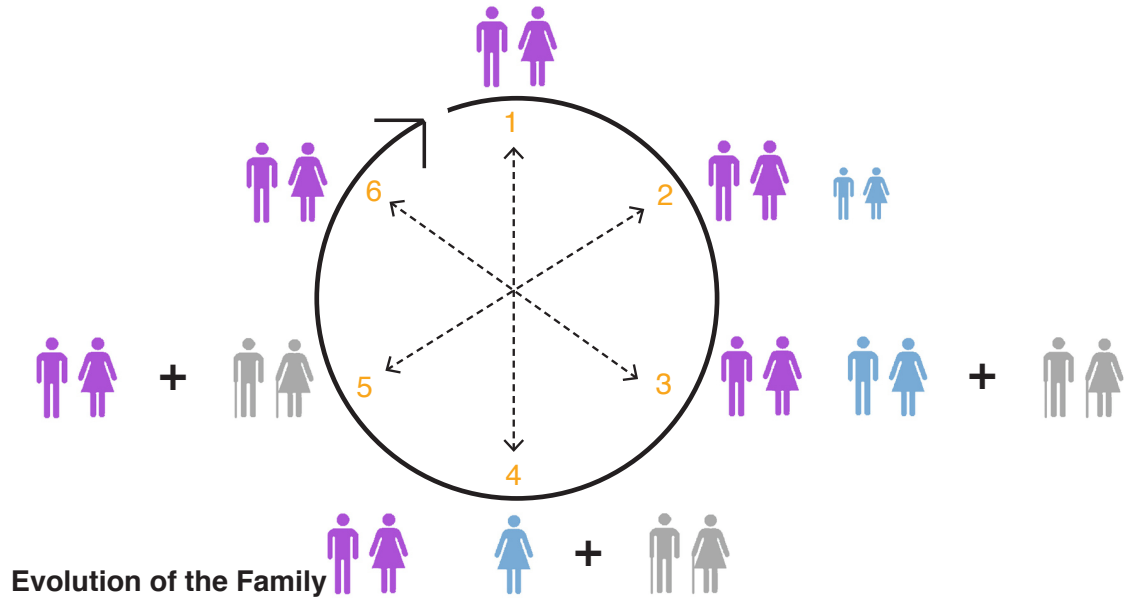


Figure 34. Evolution of the Family + Component Kit + Space Process

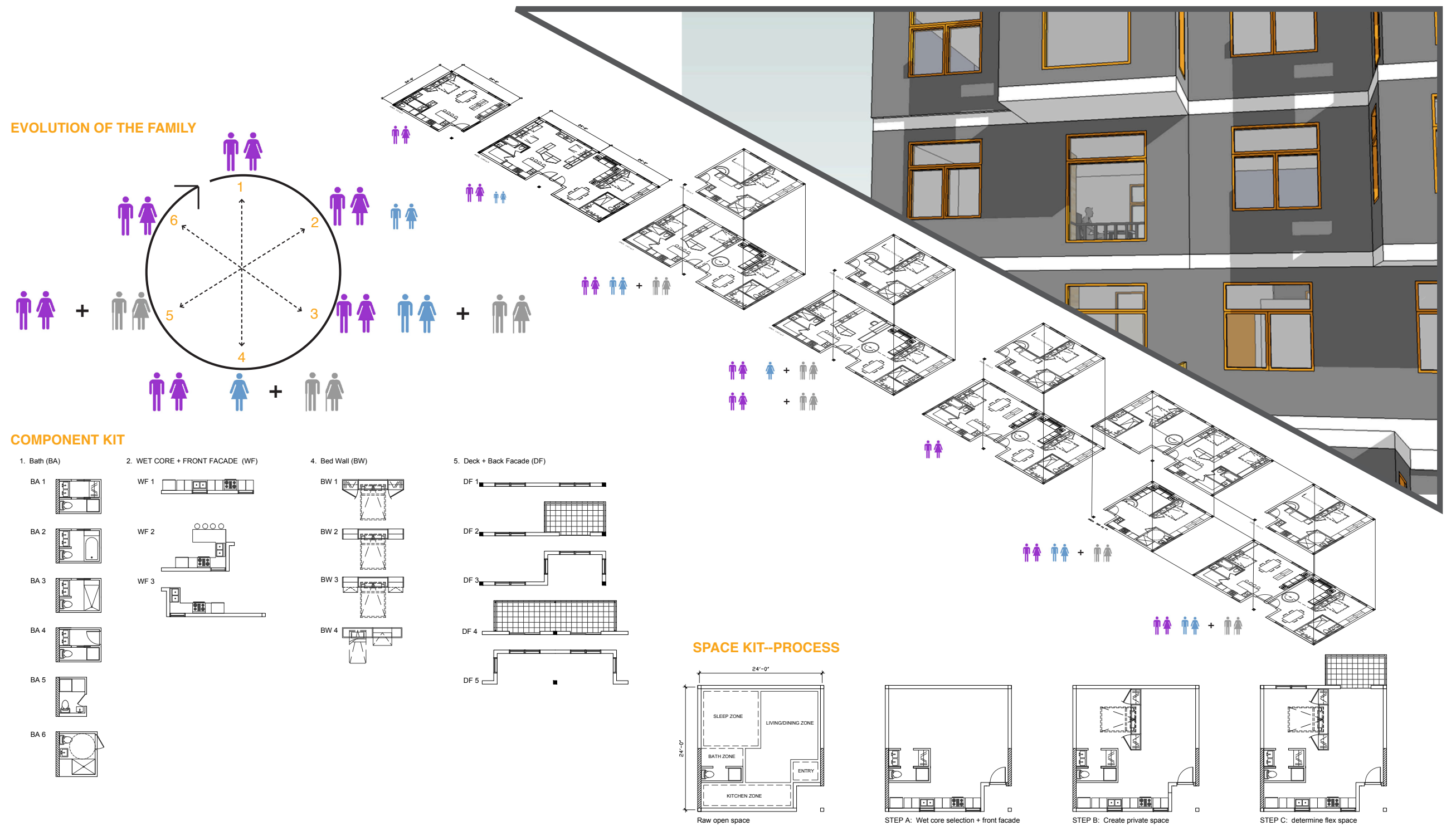
Figure 34 represents the initial design stages of the prototypical multigenerational unit. The evolution of the family diagram represents the ever changing of the family nucleus. Designing the prototype to adapt to the changing needs and family structure will create a suitable living environment for the extended family. Modular bath, wet core, bed, and façade components are devised for flexibility and adaptability. These modular components adapt to the various living conditions and diversity of the family.

The space kit process explores how the unit is programmed and created. Based on the evolution of the family and various needs of families, the apartment unit will morph accordingly to the probable changes—programmatic spaces in the home adapt to the family. The use of modular component kits provides the living space with efficient capability for modification and transformation—when the family increases and decreases in size. Prototype C reflects our modern lifestyle through its ability to adapt to the continually family shifts.

The following figures reflect the final design of Prototype C. Floor plans are designed to express the six evolution stages of the family nucleus. Each evolution is represented through a corresponding floor plan. The floor plans on each figure are divided into three sections that reflect the process of the space kit process on figure 34.

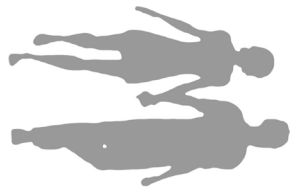
1. **Section A (raw open space):** Program/spatial arrangement of the living unit
2. **Section B (step a + b):** Once the spatial layout is determined, the zones are configured with the modular components to create an adaptable/flexible living environment based on particular needs and desires of the family.
3. **Section C (step c):** Determination of the flex space. Iterations of the finalized floor plans with a deck/outdoor space, an additional enclosed living space, or the base model.

An array of floor plan designs are generated based on the various configurations of the modular components and spatial layouts of each living unit. The floor plans adapt and evolve based on the growth and changes throughout the family's lifecycle. Each plan design reflects the evolution of the family and the corresponding floor plan/living unit or arrangement.



evolving urban unit

Figure 35. Prototype C--Evolving Urban Unit



evolution

1 Total area: 518-581 sq ft
1bed/1bath

starter apartment for young couple
• 1bed to single living space

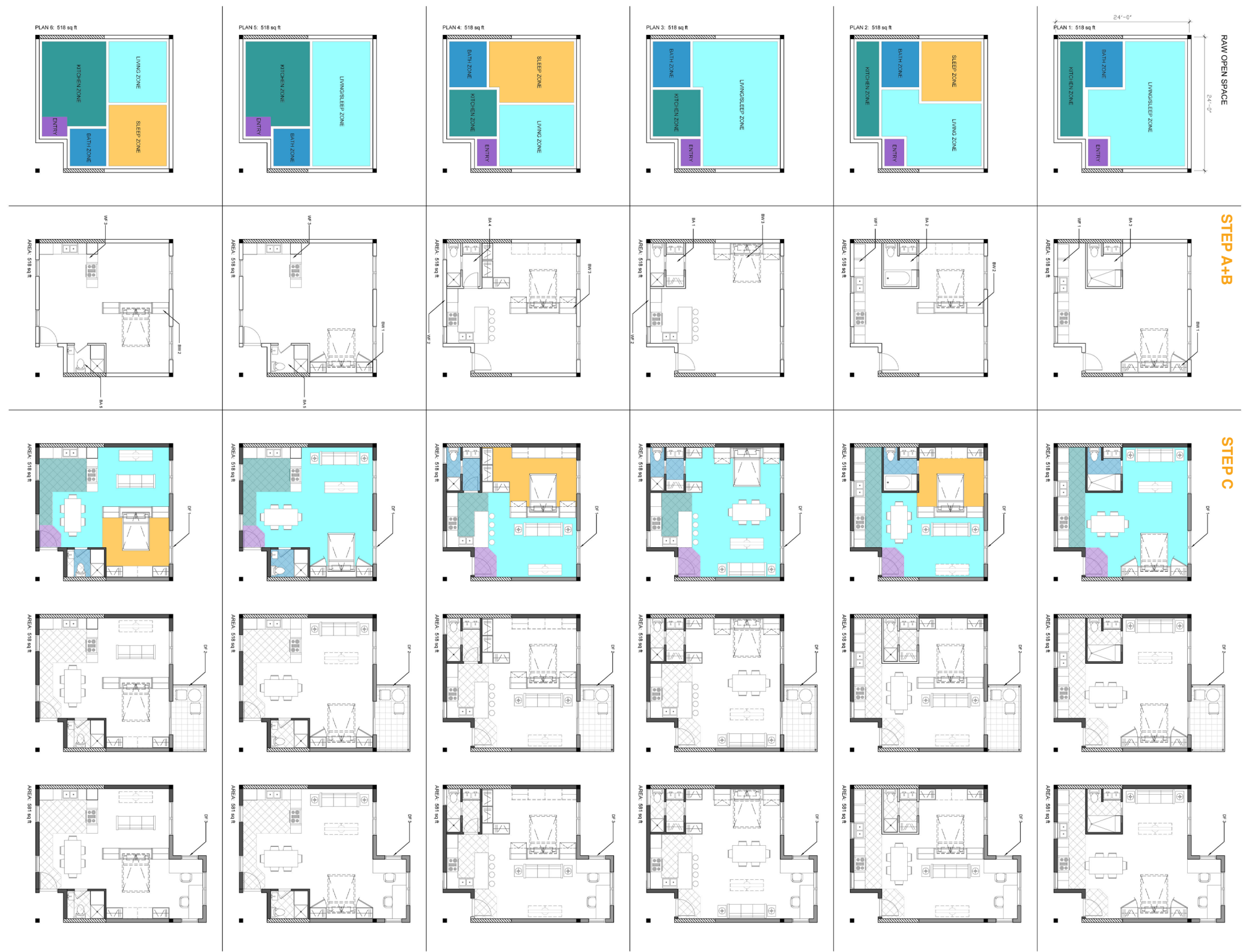


Figure 36. Prototype C--Evolution 1



Figure 37. Prototype C--Evolution 2



evolution **3**

Total area: 1,437-1,572 sq ft
4bed/3bath
2-levels

the multigenerational unit

- rooms adapt to the changing needs of child to adult
- additional living space for grandparents

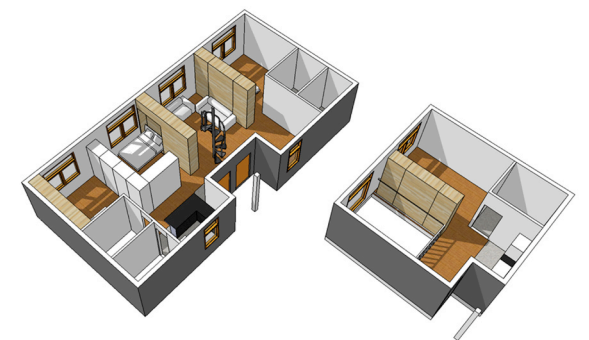
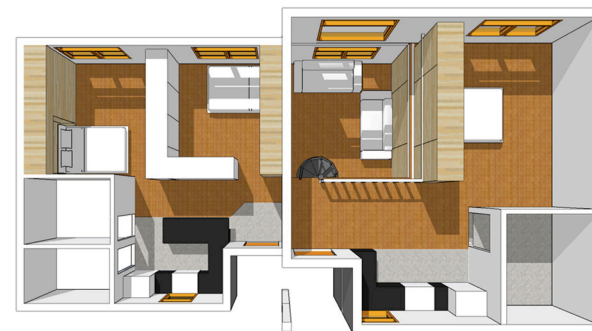
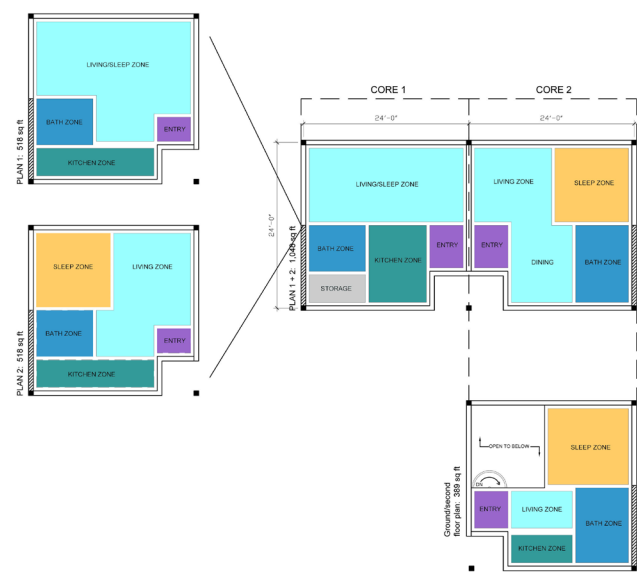


Figure 38. Prototype C--Evolution 3

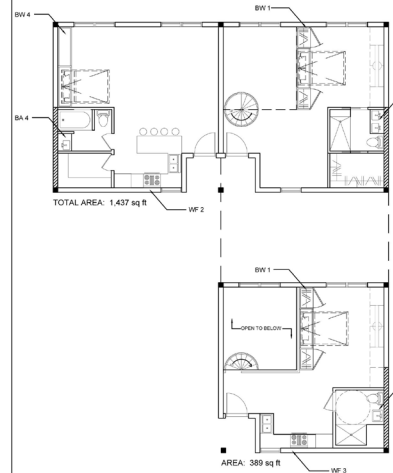


Figure 39. Prototype C--Evolution 4/5

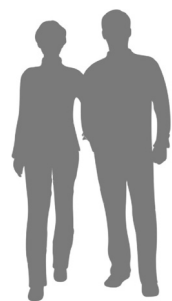
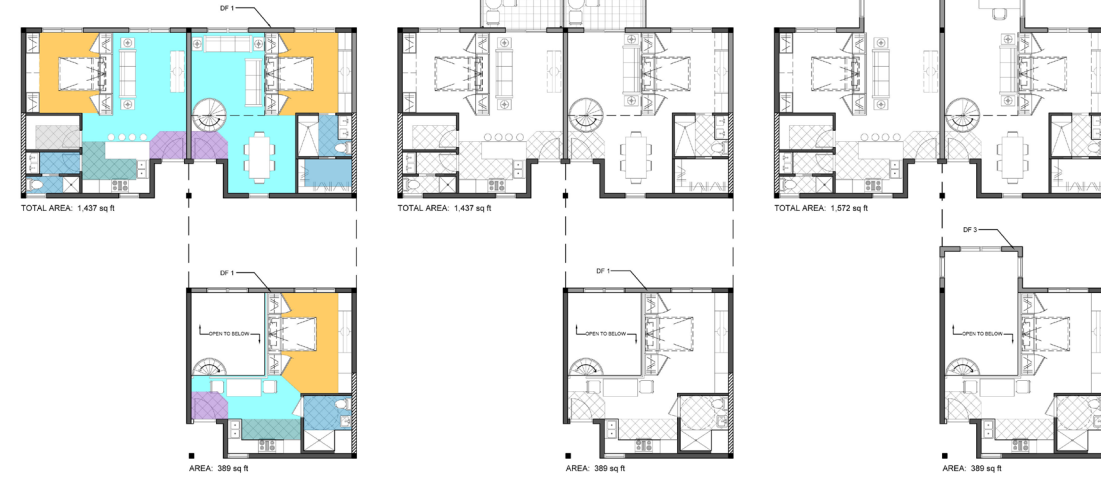
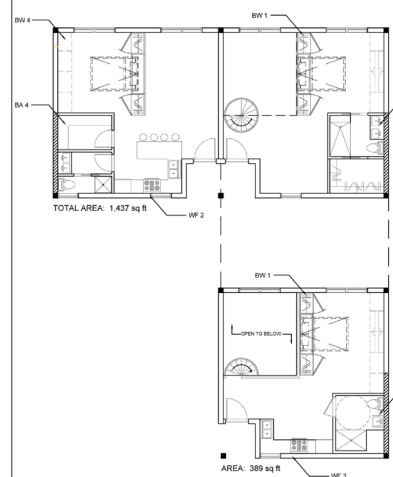
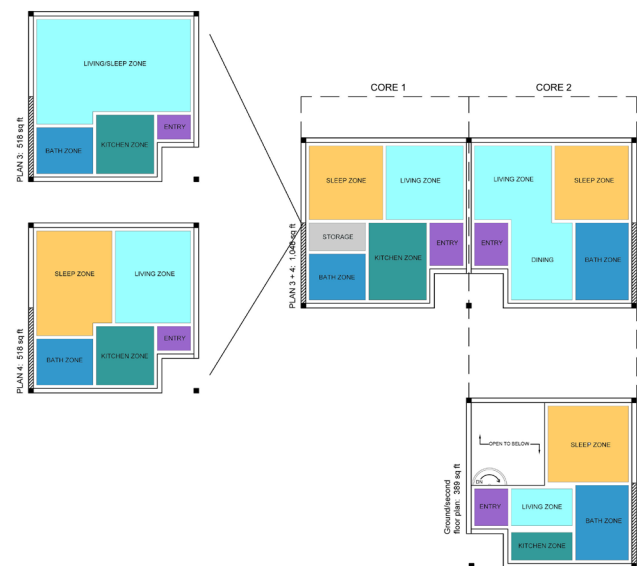
RAW OPEN SPACE



STEP A+B



STEP C



evolution⁶ Total area:
core 1-518 sq ft 1bed/1bath
core 2-907 sq ft 2 bed/2bath 2-levels

- empty nesters
- children and grandparents have departed
 - expanded household feels too large--sell part of the dwelling and live in either core 1 or core 2

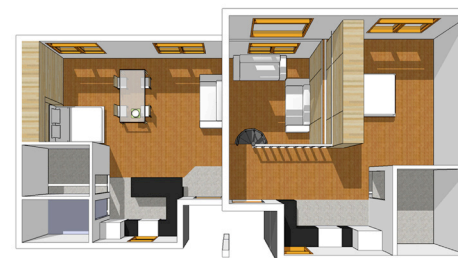
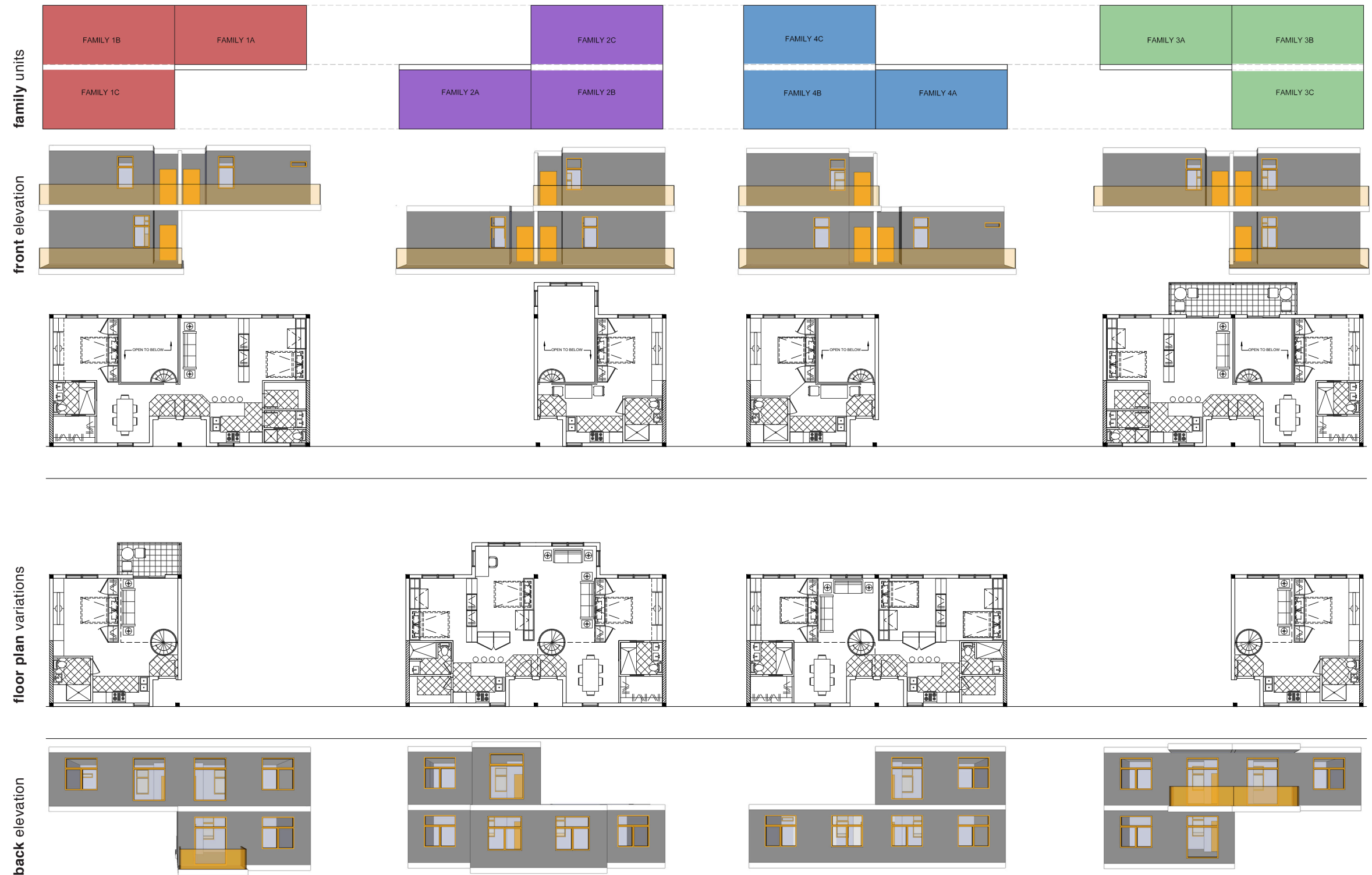


Figure 40. Prototype C--Evolution 6



buildupthemultigenerationalunit

Figure 41. Prototype C--Build up the Multigenerational Unit

Prototype D Design

Prototype D is a refined design form of Prototype C. Prototype D employs the same design process as Prototype C, but further explores the componentization of modular elements and flexibility of program spaces to create and adapt to various lifestyles and lifecycles of multigenerational families. The figure depicted on the page, reflects the various components that are utilized in Prototype D.

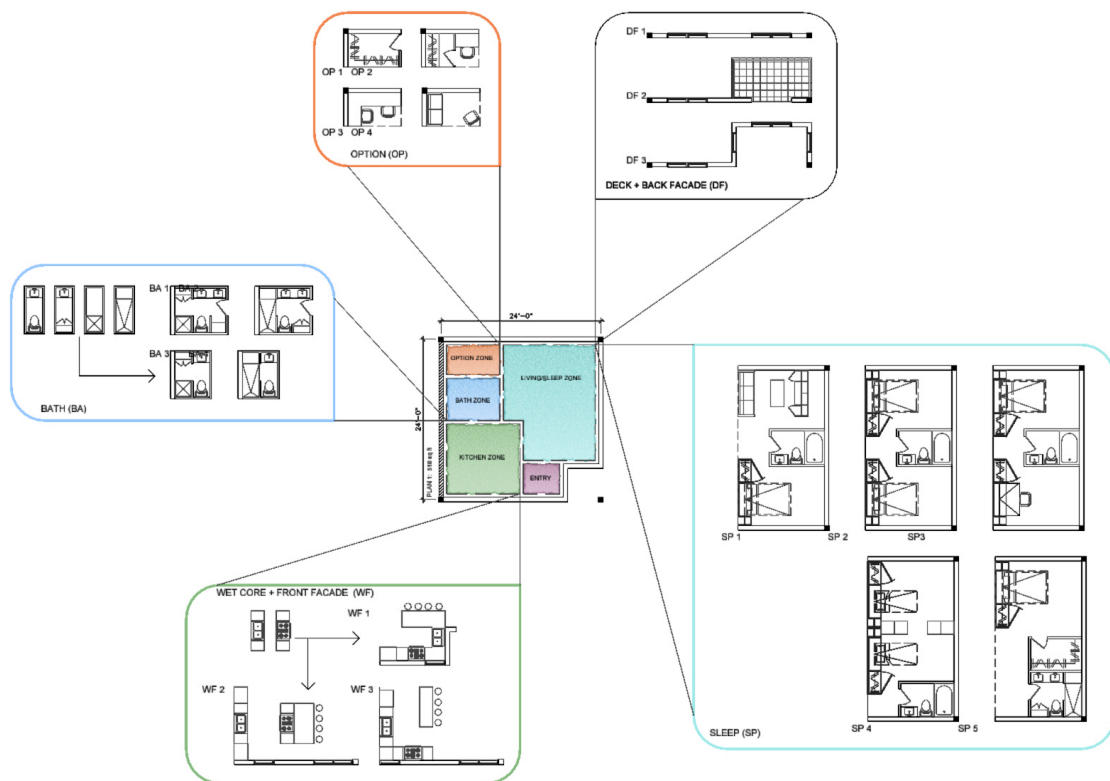


Figure 42. Prototype D Component Kit



Figure 43. Prototype D--Floor Plans

Prototype C + D Design Composition and Conclusion

In present society, the word family is virtually becoming a vague concept. In a rapidly changing society, the traditional family perception of a father, mother, and child, is no longer the epitomized family structure. Single-parent households, non-family households, and multigenerational households have sprouted to become a major element in the reinvention of families.

Across the nation, multigenerational households account for nearly 3.9 million, approximately 33,000 households in Hawaii are reported as multigenerational.¹¹⁶ Living under one roof with three or more generations has its challenges, but also provides many benefits. Having strong cultural values on the family, Hawaii residents view multigenerational households as living arrangements that care for all. It is by virtue or obligation to take care for another, especially our elders. Therefore, how do architects rethink the standard inflexible home to provide for the extended family? With the highest percentage of multigenerational families, Hawaii is in need of a housing intervention to eliminate the rigidity in our living environments and embrace housing concepts based on flexibility.

To create an adaptable living environment for the multigenerational family, dynamic entities must be considered in the development of the individual living unit. Modular structural system and componentized elements provide families with a system to customize and re-customize their home throughout the lifecycle of the household and family. This flexible system enables the household to grow and match the evolution of the multigenerational family. The figures below represent the design composition of the flexible urban apartment unit for the multigenerational family. The design takes into

¹¹⁶ United States Census Bureau, n.p.

consideration the evolving family nucleus, generational differences, various needs and lifestyles, modularity, and an innovative structural form to create a dense urban complex.

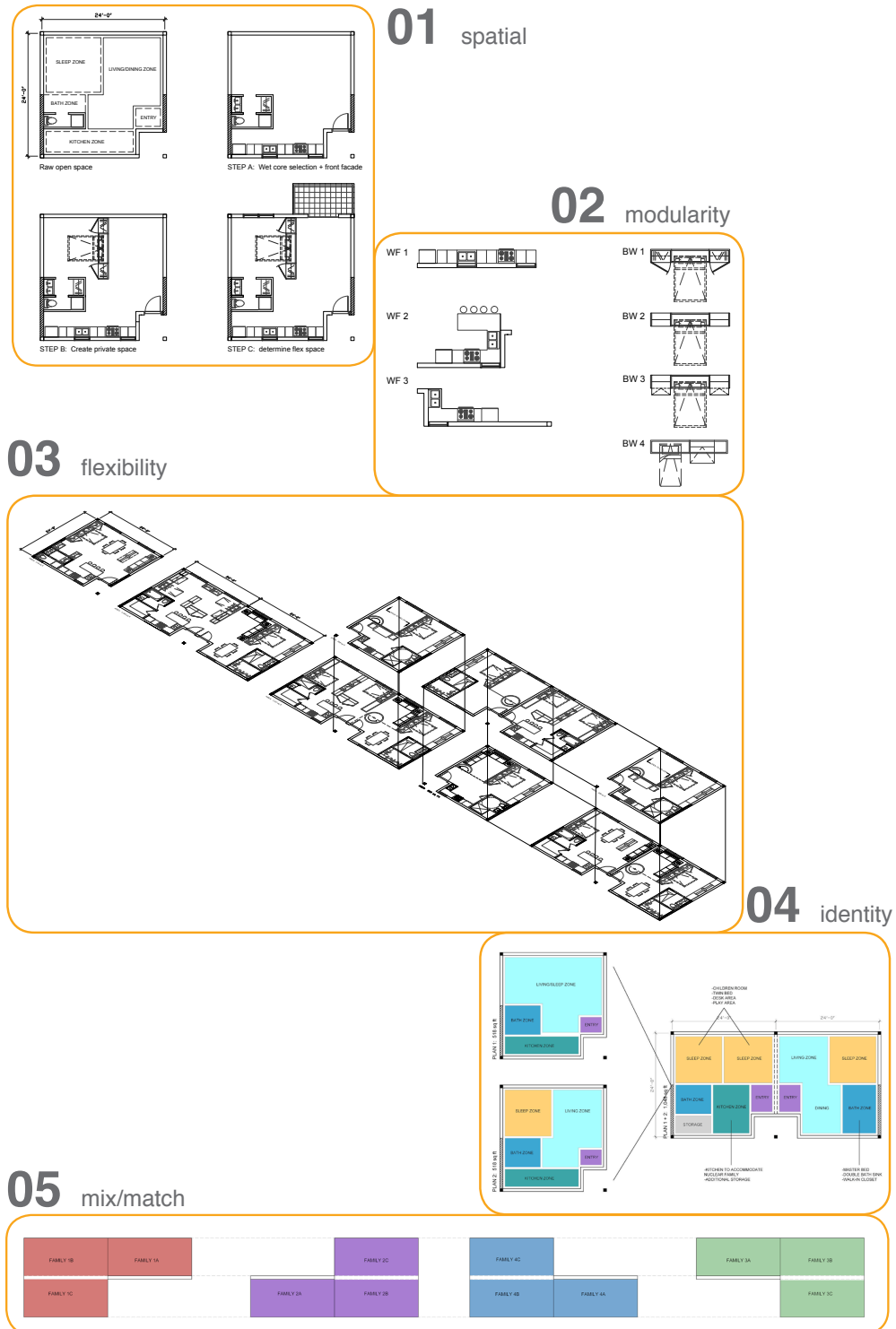


Figure 44. Design Composition

Elevation + Form

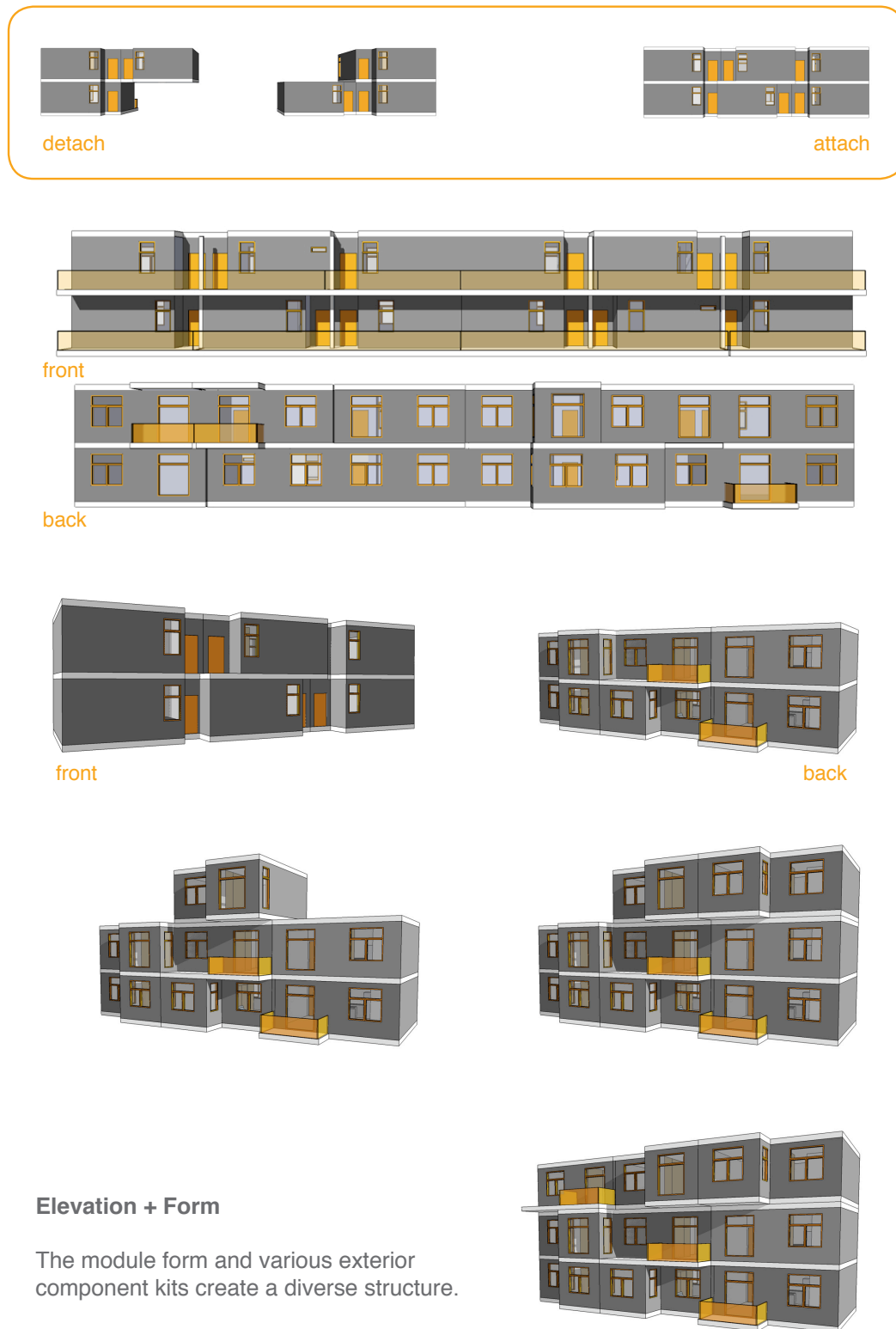


Figure 45. Elevation + Form

Model + Renderings

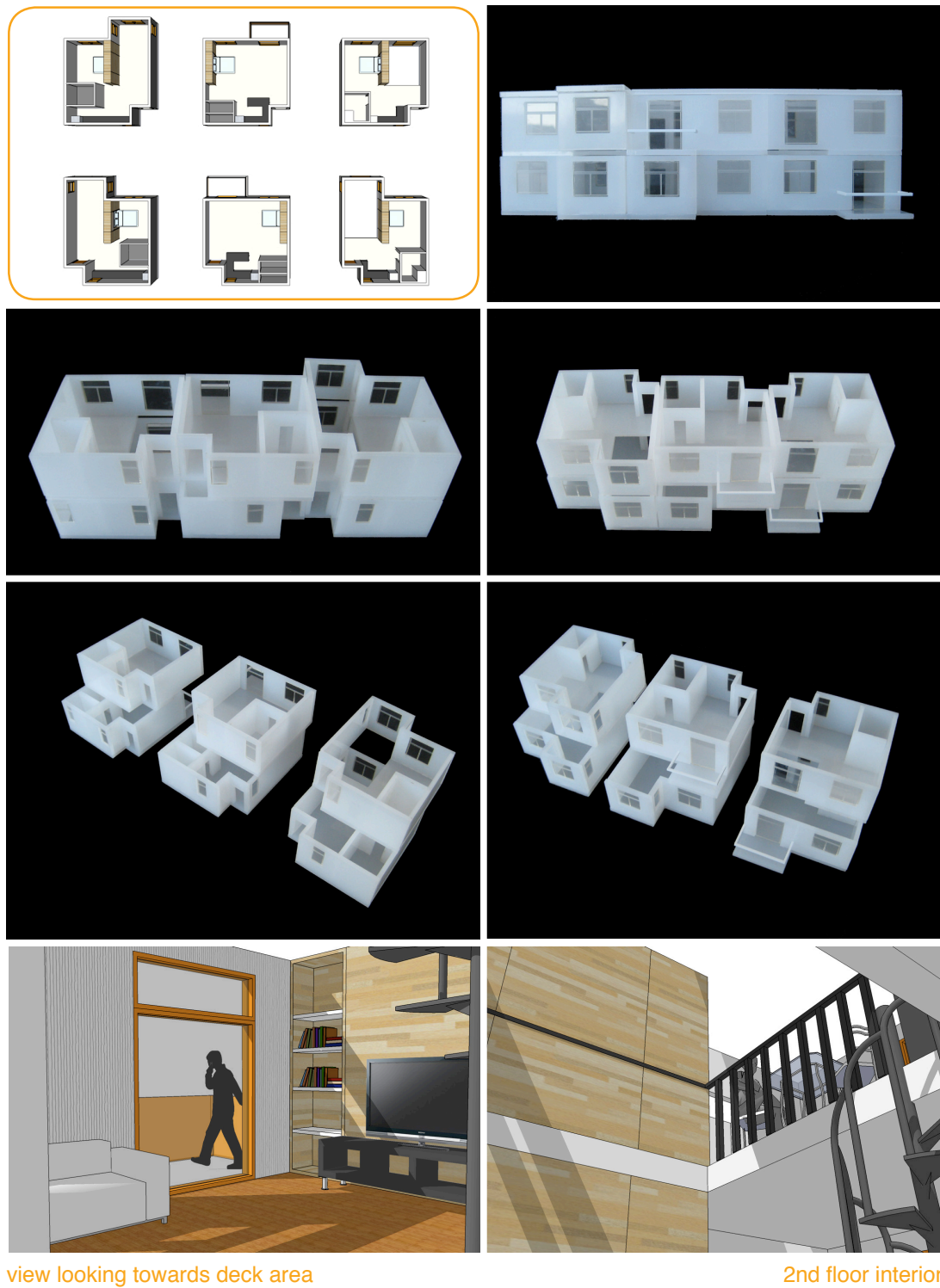


Figure 46. Model + Renderings

CHAPTER 8. CONCLUSION

According to the U.S. Census Bureau, approximately 4% of the nation's households are accommodating three or more generations. Leading this type of living arrangement is Hawaii, which accounts for 8.2% of the states' multigenerational family households. This high percentage is a result of high cost of living, large immigrant population, and the strong cultural values that place an emphasis on supporting the '*ohana*'.¹¹⁷ This trend will continue to increase and create housing challenges for families living an extended lifestyle. Furthermore, families across the nation and especially in Hawaii are finding living together as a possible solution to ease the societal shifts occurring today.

The research took on a qualitative study to explore the lifestyles and living conditions of families existing in a three or more generational home. Assessment of demographic statistics and data collected through interviews of multigenerational families in Hawaii (interviews) produced the initial design studies for an adaptable multigenerational residential design. Research indicates that due to the economic downturn, higher life expectancies, cultural and social changes, and the rising cost of living, families are reverting to a lifestyle of multiple generations. The interviewed families agreed that listed conditions, especially the strong cultural aspects in Hawaii are reasons for households accepting the multigenerational lifestyle. As households become a multigenerational concept, families are finding living conditions difficult to adapt. With multiple generations (various individuals, age groups, and lifestyles) residing in a space, the household should reflect the various social dynamics. However,

¹¹⁷ Rodriguez, 6.

families are adapting their lifestyle to an inflexible living environment—a standard nuclear dwelling concept. Whereas the premise should be positioned as the living environment adapts to the family's dynamic lifestyle.

In a society where material prosperity constitutes a person's social and financial status, it is of significance to achieve and convey personal assets. The house, a symbol and identifier of wealth and status, is the ultimate goal that expresses stability—economically and socially. However, our notions on how our homes can obtain these goals may seem obscure to a number of individuals and families. The objective of the design is to create a prototypical apartment complex that adapts to the multigenerational family. Flexibility/adaptability and modularity are key concepts in the design of the urban multigenerational apartment unit. Due to the standard house incapacity of adapting to the family's needs and evolution, the household becomes unsuitable for multigenerational family. A home must be designed to grow and contract to reflect the changes of the family and dynamics of multiple generations. For further detail of design see Prototype C and D.

The research and design explored one type of family—the multigenerational family that consists of parents, children, and grandparents. Diverse family structures are producing an assortment of living environments. Further research should be conducted on the study of integrated living.

APPENDIX A: INTERVIEW QUESTIONS

Multigenerational Thesis Survey—Background

In Hawaii, sharing living quarters with an extended family is a growing trend that concentrates on the various needs of the family unit. According to the 2000 U.S. Census, 8.2% of the Hawaii population is living in a multigenerational household—highest percentage of households in United States. However, are current living arrangements in Hawaii appropriately designed for multigenerational conditions? With soaring housing costs and limited buildable land, Hawaii is in need of a new type of dwelling design to alleviate urban sprawl, overcrowding in homes, and address alternative living situations.

The research will focus on residential design in Hawaii to find out how multigenerational lifestyles affect housing situations in the Islands. I envision the final design product to be a prototypical apartment complex that addresses multigenerational living. The design will concentrate on a vertical living arrangement to create a microcosm for generational living.

Thank you for participating in this interview for my Architecture Doctorate research on Multigenerational living in Hawaii. Below you will find several questions that examine your family and lifestyle in an extended home. Please feel free to add any additional questions or comments on your family, lifestyle, and/or design of your home. Any additional information that I receive will help further focus my research and exploration in designing a living environment that will adjust to the dynamics of the extended family.

Interview Questions

Background of the family

1. How many generations are living in the household?
2. How long have you been living together as a unit?
3. What is the reason for living in a multigenerational home?
4. Is this living arrangement temporary or permanent?
5. What are the roles of the family in the household?

The multigenerational lifestyle

1. Where do you spend most of your time (kitchen, living room, bedroom, outside, etc.)?
2. Do you think your home reflects your current lifestyle?
3. What are the challenges and benefits?
4. What advice would you give a new family considering living in a multigenerational home (financial or legal planning)?
5. What is your opinion and outlook on the multigenerational lifestyle?
6. Why do you think Hawaii is among the highest in the nation for multigenerational households?

Design

1. How important is personal space?
2. What spaces in the home are most important and why?

3. How often do you spend time together as a family? Where do you like to gather?
4. What is the physical arrangement of your household (common/private areas)?
5. If you could redesign your home, what are some things you would change to make your home more adaptable?

Comments

Please feel free to add any additional questions or comments.

Thank you for your participation, time, and support in my doctorate research.

Ryan Shidaki

Doctor of Architecture Candidate

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APPENDIX B: MULTIGENERATIONAL FAMILY INTERVIEW SUMMARIES

Interviews

Family A

Residing on the Windward side of Oahu, Family A consists of three generations. Being a fairly new multigenerational household for approximately nine months, Family A assured the interviewer that their currently living situation has been very beneficial to the family and encourages families to reconnect with the multigenerational lifestyle. Family A believes that it is the child's duty to care for their parents, as well as to love and respect them. *Oyakoo koo* or filial piety, is a Japanese tradition.¹¹⁸ They also believe the cultural emphasis on family caring in the Native Hawaiian and Asian Pacific communities has established the "tradition" of extended families. Elders expect that their children will care for them.

As a permanent living arrangement, Family A decided to integrate the husband's mother within their 1000 square foot home. The grandmother expressed a desire to live with the family because of health reasons. It was articulated that the family had previously asked the grandmother to live with them, but the offer had been declined because the grandmother had not been prepared to leave behind her independence. Several years later, the grandmother conceded to the family's proposal with the single stipulation that she would be able to have her own living space. However, in the neighborhood in which the family was living, zoning was not available for a separate dwelling. Therefore, the family decided to add an extension onto the existing house rather than build a separate living unit against the zoning code.

¹¹⁸ Family A. Personal Interview. 4 Nov. 2008.

Family A's multigenerational lifestyle has been a positive experience thus far. The family has agreed that their present living arrangement possesses no challenges, only benefits. To the family, living in a multigenerational home offers solutions to long term care issues. Because the grandmother often needs medical attention, her living in the same household allows the family to give care when required. Nursing home care in Hawaii comes at a high cost; therefore, families are forced to take in their elders.¹¹⁹ When asked the question: "Is culture an influence in the multigenerational lifestyle?" Family A had an intuitive response: the Asian culture frowns on accepting welfare. Although benefits and entitlements are available, many Asian families choose to care for their elders rather than apply for state aid. There is also the trust factor: young parents choose grandparents to care for their grandchildren.¹²⁰ This response indicates that, in the Japanese culture, pride is an important value that regulates the family unit. Older generations retain traditional values of family structure and intergenerational bonds for emotional stability. Children are expected to take care of their parents and it is an obligation to honor customary family values. Admitting to failure or, in this specific case, assisted living negates the child's commitment to the family and elders.

Family B

Living in Central Oahu, Family B is a modern Japanese-American household with three generations inhabiting a 1500 square foot single-family dwelling. Existing as a multigenerational family for approximately ten years, Family B has well discovered the prevalent challenges and benefits of extended living. The subjects indicated that the

¹¹⁹ Family A. Personal Interview. 4 Nov. 2008.

¹²⁰ Ibid.

current living situation is temporary and the reason for becoming a multigenerational home was due to the daughter's request for assistance in raising her children.

Representative of 65% of multigenerational homes across the United States, Family B maintains a living arrangement that consists of the grandparents as primary homeowner, their two children, and two grandchildren. As a single mother, the daughter was in a financial predicament and asked her parents for support. She felt that by living with her parents, she could focus on her career, save money, and have a nurturing environment for her daughters. Being a single parent with little experience raising children, the daughter sought her parents for their experience and advice. This may be the reason why multigenerational households exist and were successful in the past—family members reside with each other for mutual support.

The multigenerational lifestyle is a complex social pattern that generates many challenges and benefits for all family members. When asked the question: "Do you think your home reflects your current lifestyle?" the subjects openly responded that their home is a major factor that challenges the household. With a three bedroom, two baths home, to accommodate four adults and two children, privacy and noise are always a problem. "Had we known in the future we would be living in this type of extended arrangement, modifications to the home would have been made. More bedrooms and additional living spaces."¹²¹ Family B views their personal home as an obstacle to extended living. The inflexibility of space within their home produces overcrowding and impractical areas. Spaces that could be utilized as additional living areas are necessarily transformed into storage. The family agrees that a more flexible or adaptable home would benefit the multigenerational environment.

¹²¹ Family B. Personal Interview. 25 Oct. 2008.

Family B states that the emotional and social benefits of living in a multigenerational home prevail over any inconveniences. The grandparents have the benefit of raising and seeing their grandchildren grow. Grandparents get emotional satisfaction from frequent interaction with their grandchildren. Their role also serves as a symbol of continuity and stability.¹²² Additionally, the grandchildren receive unconditional love from grandparents, parent, and other family members. In the case of Family B, the grandparents' look after both grandchildren they assist with afterschool activities and homework, and provide care for their grandchildren when their daughter is at work. This frequent interaction between grandparent and grandchild enriches the lives of all parties. The grandparent teaches the grandchild about family values, respect, and the importance of becoming a well-rounded individual, while the grandchild reciprocates by filling her grandparents' lives with youthful elements. In Family B's living arrangement, many benefits result from the multigenerational lifestyle.

Family C

Representing a multi-ethnic four generational home, Family C resides in west downtown Honolulu. As a permanent living arrangement, Family C has been living the extended lifestyle for over twenty years. The decision to become a multigenerational family was due to convenience and as a response to the high cost of living in Hawaii. Family C perceives their current living arrangement as a cultural adaptation.

We were taught to take care of others, to give back to the people that helped us especially our family. That is why most people in Hawaii

¹²² Graham, 41.

cannot fathom sending their parents to some elderly home with no family there to look after them.¹²³

In the case of Family C, the subject who was interviewed considers the multigenerational lifestyle a hectic way of living that tests how multiple personalities interact with another. "It is a challenge to get along with everyone, as there are different personalities and needs to be addressed. Living in a multigenerational household is not for everyone, especially if you are a private individual that respects their own space."¹²⁴ The interviewee addresses the personal element of living in an extended environment. Relationship issues can be associated with generational differences or one's position within the family: parent, in-law, adult, or child. Problems can also arise out of personality conflicts between individuals. In all these instances, it is advisable to establish ground rules for communication.¹²⁵ Therefore, the fundamental rule for a successful multigenerational lifestyle is to communicate with each other. With proper communication, problems can be resolved and needs fulfilled. Appropriate communication among family members will create a positive living environment and enhance healthier relationships.

Family D

Living in the Ewa Plains of Oahu, Family D is a recent recipient of Hawaiian homestead in Kapolei. Having to wait twenty years for their homestead lease, this three generational family is blessed to have a new home. The subjects that were interviewed were the grandparents and owners of the household. Their current living arrangement

¹²³ Family C. Personal Interview. 8 Nov. 2008.

¹²⁴ Ibid.

¹²⁵ Graham, 253.

includes their daughter and grandchild. The grandparents were informative and open about their multigenerational lifestyle and home.

In Hawaiian society, the *‘Ohana* or family unit is a concept that unites value, traditions, and culture into the living structure of the family. The Hawaiian culture requires one to respect the *‘āina* (the land), the elders, and the family. Living in a multigenerational home is a traditional practice that must be preserved.¹²⁶ The subjects feel that modern Hawaiian culture is limited and suppressed. They want to practice traditional hula, chants, and customs within their home, but their current living arrangement prohibits these traditional observances. The interviewees explain that due to strict regulations enforced by the Kapolei association, families in the district are not able to assimilate traditional cultural values into their modern lifestyle.

Family E

Living as a multigenerational unit for only a few years, Family E represents a three generational household: the wife’s mother, wife, husband, and two children. Residing in the central district of Oahu, Family E became an extended family because of the high cost of living and, most importantly, the interviewee’s desire to provide care for her mother. The subject explains that it is rooted in her Asian culture and lifestyle to care for her parents. It is again the concept of filial piety—to respect elders and parents—that is the impetus for many families in Hawaii to live an extended lifestyle. The interviewee also stated that the limited buildable land on the islands is impacting families and leading them to live with one another.

¹²⁶ Family D. Personal Interview.

In the case of Family E, a unique element in their multigenerational living arrangement incorporates her extended family living next door. The subject reiterated with the interviewer that when her family was looking for a new home, she wanted to live close to her aunty, uncle, and grandfather.

Family E, as was true of many other extended families that were interviewed, described their multigenerational living arrangement as “hectic.” When asked the question: “Do you think your home reflects your current lifestyle?” the homeowner replied, “Yes, chaotic. I try to find multiple uses and functions for everything.”¹²⁷ This interesting perspective focused on the value of adaption. Not only do families need to adapt to multitude of personalities, but also an alteration in living environment that fits their extended lifestyle is necessary. “In my household, the kitchen has multiple purposes, to cook, gather, and provide medical care to my mother and children.”¹²⁸ This reveals the value of space within a home. In a society where change is inevitable, families--especially multigenerational families--utilize their livable space in creative and adaptable ways; all spaces are used and serve as multifunctional areas. The home must not only profile the inhabitants, but their evolving needs and living environment.

Family F

As a three generational home residing in Honolulu, Hawaii, this Filipino family has been living the extended lifestyle for approximately six years. The subject indicated that the primary reason for becoming a multigenerational family was to foster mutual support among family members in a new country. As immigrants from the Philippines, family members were not yet financially able to purchase or rent a home. They felt that

¹²⁷ Family E. Personal Interview. 2 Dec. 2008.

¹²⁸ Family E. Personal Interview. 2 Dec. 2008.

by living with each other, the transition to a new country would be manageable: financially, socially, and culturally.

The subject defines the typical roles of the family. The primary role of the grandparents is to take care of grandchildren when the parents are not home; however, the grandparents are also working part time. Aunties and uncles typically work one or two jobs to contribute funds for the rent and utilities of the household. Children assist in daily household activities and also take care of the elders. In Family F, the elders are the primary financial contributors to the household and their children provide a supportive role. This display of specific roles is typical among families living in a multigenerational household.

With ten family members living in a detached single-family dwelling, numerous challenges and benefits are presented. As for their home reflecting their current lifestyle, the subject indicated that she does not think her home reflects an extended environment or the current family lifestyle.

At the close of the interview, the subject explained her perspective on the multigenerational household. She states: "I think it is common here in Hawaii, even if you are not an immigrant. The cost of living [in Hawaii] is so high that it is almost necessary to live with extended family/parents/grandparents to cut cost and save money."¹²⁹ This interview was significant because it revealed how culture impacts the way a family exists in their home. In the case of Family F, culture was an important factor in the decision to reside in a coexisting environment. As immigrants from the Philippines, extended living is a cultural practice that is highly favored. When the family

¹²⁹ Family F.

decided to move, perpetuating this cultural standard in America was a way to adapt to a foreign environment, while maintaining identity and heritage as Filipinos.

Family G

Living in a three generational home for nearly 25 years, Family G was brought together in this lifestyle due to the high cost in living and housing on the island. As a native Hawaiian, the subject indicated that family life is an important part of his culture. He believes that the cultural aspect and high cost of living in Hawaii are the two largest influences impacting high percentage of multigenerational homes.

Family G describes the specific roles within the household. Being the homeowners, the grandparents perform basic household chores—cooking, gardening, and laundry. The father, who is a full time employee, is the primary provider in the household. The children who are attending various schools on the island are in charge of the daily household chores. The children also assist with the household finances. Family G has found this communal living a successful way to reconnect with traditional Hawaiian values, while sustaining a healthy, modern, affordable lifestyle.

The subject indicated that his current living arrangement is very comfortable and engaging. “I enjoy my multigenerational home. I grew up in it, so it was easy. I love living with my family and grandparents. The family aspect is what I enjoy the most.”¹³⁰ To the subject, living in a multigenerational household was something he did not have to become accustomed to. He was raised in a communal environment and perceives the extended lifestyle as a way to strengthen family ties and relationships. For a few families, overcoming lifestyle differences in a multigenerational household may take time

¹³⁰ Family G.

and a few adjustments. Through communication, an understanding of personality variations and other preferences will add balance to a family's living situation.

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